



European Social Partners in Education Embracing Digitalisation



Final research report

on challenges and opportunities
for the education sector
in the digital era

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Glossary

Bildung a didactic and pedagogical concept in the Danish education system tradition referring to the holistic framework for education and formation of young people

Blended /hybrid learning learning where face to face and digital tools are mixed

Collective bargaining a process of negotiation between employers and a group of employees aimed at reaching collective bargaining agreements to regulate working salaries, working conditions, benefits, and other aspects of workers' conditions, compensation and rights for workers

Continuous professional development a process of maintaining and updating professional skills, knowledge and expertise throughout the working career

Digital education eco-system education stakeholders, systems, and an enabling environment that together empower educators and learners to use digital tools in a holistic manner

Digitalisation in education increasing the use of digital tools in the process of teaching, learning and assessment at education institutions

Digital divide inequality of access and use of digital tools between education system stakeholders and learners based on their socio-economic characteristics

Digital skills skills related to the ability to be digitally literate and safely participate in, benefit from and contribute to the digital world. Basic digital skills allow a basic ability to use digital tools, devices and online applications (for instance to access, filter and manage information). Advanced digital skills are specialised skills such as high-performance computing, artificial intelligence and cybersecurity

Digital competence confident, critical and responsible use of, and engagement with, digital technologies for learning, work, and participation in society. The European Digital Competence Framework¹ has identified the key components of digital competence in five areas: information and data literacy; communication and collaboration; digital content creation; safety; and problem-solving

Digital tools electronic and computerised technologies

Emergency remote teaching a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances

Formative assessment a range of assessment practices conducted during the learning process

Initial professional training training undertaken by an entrant into the teaching profession

New emerging technologies a range of technological advances driven by the use of algorithms, such as artificial intelligence (AI), blockchain and robotics

Online education teaching, learning and assessment undertaken in the online environment

Social dialogue process whereby social partners (trade unions and employer organisations) negotiate, often in collaboration with the government, to influence the arrangement and development of work-related issues, labour market policies, social protection, taxation or other public policies

Summative assessment a range of assessment practices conducted after the learning process

1 [Digital Competence Framework for Educators \(DigCompEdu\)](#) | [EU Science Hub \(europa.eu\)](#)

1. Introduction

This report presents the final research results undertaken in the framework of the joint project by European social partners in education – the European Trade Union Committee for Education (ETUCE) and the European Federation of Education Employers (EFEE) – on challenges and opportunities for the education sector in the digital era, carried out in 2020-2021.

The main aim of the project was to enable a joint social partner ETUCE/EFEE reflection on the potential of the digital era to improve the education sector, with a view to raising the attractiveness of the teaching profession. This project aims to feed into ETUCE's and EFEE's joint work in the context of the European Sectoral Social Dialogue in Education (ESSDE), in view of the current joint work programme priority: 'Innovative teaching and learning in the 21st century'.² The project also follows up on the 2018 joint declaration 'Towards a Framework of Action on the attractiveness of the teaching profession', as it examined the potential and challenges of the digital era for the attractiveness of the teaching profession.³

The project was undertaken in the context where digitalisation has rapidly transformed the education sector, with the emergence of new required skills for teachers, school leaders and other education personnel. The increasing use of digital tools in everyday pedagogical practice is set to bring about new opportunities, but also new challenges. The education sector is central in providing young people and adults with the set of skills necessary to enter and remain in the workforce and become active, critical and informed citizens. Appropriate consultation and involvement of social partners in education will ensure that policies developed regarding the use of digital tools in education benefit the whole of the education sector, including teachers and other educational personnel, education institution leaders and managers and education policymakers, as well as parents and learners.

The project also echoes important European policy priorities in relation to digitalisation in the education sector. In particular, the EU's current Digital Education Action Plan (2021-2027) calls for high-quality, inclusive and accessible digital education in Europe⁴. In achieving this vision, the EU wants to support high-performing digital education ecosystems, including digitally competent and confident teachers and education and training staff as well as high-quality learning content, user-friendly tools and secure platforms which respect privacy and ethical standards. Furthermore, the latest EU initiative in the context of recovery from the COVID-19 pandemic also emphasises support to digital transitions, allocating 20% of the available funding of €672.5 billion to digital transitions, including education and training for digital skills.⁵

At the start of the project in November-December 2020, an online survey on digitalisation in the education sector was undertaken to gather experiences, views and good practices among the ETUCE and EFEE member organisations. In total, 70 responses were received, across the education sectors and countries members of ETUCE and EFEE. Further details about the survey are provided in Annex 1.

2 [Work Programme - European Trade Union Committee for Education \(csee-etu.org\)](https://csee-etu.org/work-programme)

3 See [Joint ETUCE/EFEE Declaration Towards a Framework of Action on the attractiveness of the teaching profession \(November 2018\) - European Trade Union Committee for Education \(csee-etu.org\)](#)

4 See [Digital Education Action Plan \(2021-2027\) | Education and Training \(europa.eu\)](https://europa.eu/digital-education-action-plan)

5 See [Recovery and Resilience Facility | European Commission \(europa.eu\)](https://europa.eu/recovery-and-resilience-facility)

Following the survey, two online format case studies took place in Denmark (February 2021) and Romania (April 2021) with the interviews conducted with the range of education system stakeholders in both countries. The aims of the case study visits were to:

- Identify and discuss examples of practical and concrete ways to ensure optimal use of digital tools, both for the improvement of education personnel's employment and working conditions and for better teaching and learning practices;
- Dive deeper into the topics identified by the survey results and the Advisory Group meetings;
- Discuss the concrete impact of the practices in place as regards the use of digital tools on teaching, learning and education staff's working conditions.

In Denmark, inputs were received from the national social partners, including the presentations from the education trade union Gymnasieskolernes Lærereforening (GL) and the Ministry of Education. In addition, two education institutions were visited, namely, a secondary school in the vicinity of Copenhagen, where interviews with the school leader, two teachers and two students were conducted. In addition, interviews were conducted in the teacher training institute in Denmark with the institution leader, one teacher trainer (who is also a teacher himself) and one newly qualified teacher. In total, the perspectives of 10 stakeholders in the Danish education system were heard in the case study visit.

In Romania, contributions were heard from the national social partners in Romania, including the Ministry of Education and the trade unions "Alma Mater" NTUF and FLSI. In addition, a technical university in Bucharest was visited, including interviews with the institution leader (rector), two heads of faculties/lecturers and two students. A primary school in Bucharest was also visited, including interviews with the school leader, a teacher, and two pupils. In total, the perspectives of 12 stakeholders from across the Romanian education system were heard during the case study visit.

This report brings together the findings of the research activities in the project, including the results of the online survey and the findings from the consultations in the two case studies. The following report consists of the following sections:

- Section 2 discusses the findings on the impact of COVID-19 on digitalisation in education,
- Section 3 presents the views on key challenges and opportunities posed by digital education,
- Section 4 provides an overview of the findings in relation to the importance of digitalisation in education policies,
- Section 5 shows how digital technologies are used in the education system.
- Section 6 discussed the digital skills of education personnel.
- Section 7 shows the existing measures on digitalisation in education.
- Section 8 discusses findings in relation to the future of digitalisation in education.
- Section 9 concludes with the recommendations for action by EFEE and ETUCE.
- The report is accompanied by the following Annexes:
- Annex 1 provides details of the online survey of ETUCE and EFEE national members conducted in the framework of the project,
- Annex 2 includes a summary of findings from the case study visit in Denmark,
- Annex 3 provides a summary of findings from the case study visit in Romania.
- The impact of COVID-19 on digitalisation in education

2. The impact of COVID-19 on digitalisation in education

KEY FINDINGS

- Education systems around Europe have been profoundly affected by the COVID-19 pandemic.
- Education institutions resorted to emergency remote teaching⁶, for the majority the transition was partial and most are planning to go back to pre-COVID-19 education models.
- Education institutions, staff and leaders have done well to cope with this online education transition, especially when they were prepared and supported in such adaptation.
- Most of the education institutions were at least partially prepared to address the impacts of the pandemic – with a third of cases where the education institutions were not sufficiently prepared.
- Factors such as the different levels of maturity of institutions to move to online education, the lack of digital infrastructure, the lack of digital skills and work overload and pedagogical concerns over the suitability of such learning for the needs of learners, were reported as challenges during the pandemic.
- In addition, concerns were raised by some educators in relation to the lack of reflection of local / regional circumstances, the lack of operational and practical guidelines and the lack of immediate funding available for moving to emergency remote teaching.

The project research activities showcased the profound impact of the COVID-19 pandemic on digitalisation in education. The project implementation and findings from project activities have been strongly affected and influenced by the move to emergency remote teaching as a response of the education system to the COVID-19 pandemic.

6 Understood here as a temporary shift of teaching instruction delivery to an alternate delivery mode due to crisis circumstances Hodges C., Moore S., Lockee B., Trust T., Bond A. (2020). The difference between emergency remote teaching and online learning. *Educase Review*. <https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning>

2.1. The response of education systems to the COVID-19 pandemic

The online survey explored how far the pandemic affected the education systems of EFEE and ETUCE national affiliates. As shown in table 1, **education systems in all survey countries have resorted to elements of online education (i.e. emergency remote teaching)** during the pandemic with no national education system left untouched.⁷ All national members indicated that their education systems resorted to some form or element of online education during the initial phases of the pandemic (i.e. March 2020 - June 2020). This transition was either full or partial, depending on the circumstances. In the years 2019-2020, about 33% of respondents were fully teaching online, during the latter part of the academic year from March to June 2020. In **around two-thirds of cases**, the move to online education was **partial**. In the 2020-2021 academic year, the partial move to online education has increased further, as reported by nearly 80% of survey respondents.

Importantly, however, this significant move to online learning is not likely to be retained in the future. As shown in Table 1, around **70%** of survey respondents report that most schools and other education institutions, at the time of the survey in late 2020, were **planning to go back to pre-COVID-19 face-to-face education models**.

The views on this aspect were very similar across members of ETUCE and EFEE, with EFEE members reporting a slightly higher move to entire and partial online education compared to ETUCE members.

Table 1: How have education systems in your country adapted to the COVID-19 pandemic?

2019-2020 academic year	Both ETUCE and EFEE members		ETUCE members		EFEE members	
	No	%	No	%	No	%
Education systems entirely resorted to online education during the COVID-19 pandemic	24	34%	18	36%	6	30%
Education systems partially resorted to online education during the COVID-19 pandemic	46	66%	32	64%	14	70%
Education systems never resorted to online education during the COVID-19 pandemic	0	0%	0	0%	0	0%
All responses	70	100%	50	100%	20	100%
2020-2021 academic year	Both ETUCE and EFEE members		ETUCE members		EFEE members	
	No	%	No	%	No	%
Education systems entirely resorted to online education during the COVID-19 pandemic	16	23%	13	26%	3	15%
Education systems partially resorted to online education during the COVID-19 pandemic	53	76%	36	72%	17	85%
Education systems never resorted to online education during the COVID-19 pandemic	1	1%	1	2%	0	0%
All responses	70	100%	50	100%	20	100%

Source: E-speed project survey 2020.

⁷ This is supported also by other studies, see Joint Research Center (2020). The likely impact of COVID-19 on education: Reflections based on the existing literature and recent international datasets. Luxembourg: Publication of the European Union.

Next, the survey asked about how well the different stakeholders in the education system, such as its staff and leaders, were able to respond to this profound impact of the pandemic on their teaching practice - moving from classroom teaching to online education almost overnight. As shown in Table 2, there is an overwhelmingly positive opinion from the survey respondents on this, with the majority pointing out a successful response. However, probing further, differences emerge.

Table 2: How have different education system stakeholders in your country adapted to the COVID-19 pandemic?

Do you agree that...		Fully agree	Some agree	% positive opinion	Some disagree	Fully disagree	N*	All
Schools and other education institutions have done well in coping with the COVID-19 impact on education	All	22	42	91%	5	1		70
	EFEE	7	12	95%	1			20
	ETUCE	15	30	90%	4	1		50
Education authorities have done well in coping with the COVID-19 impact on education	All	9	40	70%	10	9	2	70
	EFEE	5	12	85%	3			20
	ETUCE	4	28	64%	7	9	2	50
The teachers, trainers, school leaders, academic staff, and other education personnel in our sectors have coped well with the rapid move to online teaching	All	28	38	94%	3		1	70
	EFEE	10	9	95%	1			20
	ETUCE	18	29	94%	2		1	50
The teachers, trainers, school leaders, academic staff, and other education personnel in our sectors were well supported during the COVID-19 changes to teaching	All	11	34	64%	20	4	1	70
	EFEE	6	12	90%	2			20
	ETUCE	5	22	54%	18	4	1	50
Most schools and other education institutions in our sectors, at the time of the survey, are planning to go back to pre-COVID 19 education models	All	21	26	67%	19	3	1	70
	EFEE	3	7	50%	9	1		20
	ETUCE	18	19	74%	10	2	1	50

Source: e-Speed project survey 2020. * no response.

Similarly, **over 90%** of survey respondents considered that **both schools and other education institutions and the education staff and leaders** (the teachers, trainers, school leaders, academic staff, and other education personnel) have **done well** in coping with the COVID-19 impact on education and the rapid move to online teaching. In this context, there is also very little difference of opinion between ETUCE and EFEE members.

The positive responses highlighted in the survey include institutions developing mixed processes of distance and in-class teaching and taking a collective and adaptable approach with education system staff responding creatively and with innovation and energy. It was also increasingly acknowledged that digital education brings its own value, or in the words of one respondent,

“the future of education brings a new teaching style combining face-to-face teaching for practical applications and online teaching for theoretical aspects and dissemination”.

This finding from the survey was also echoed in the case study findings in Denmark and Romania.

In Denmark, the education system was ready to respond to the medical emergency very well due to its high level of digital maturity across education preceding the pandemic. The lessons at schools took place as scheduled, and teachers have developed and evolved their teaching practices and approaches as the emergency teaching context progressed over months. The emergency teaching went well because the teachers were ready to use digital tools beforehand and this has worked well for a restricted amount of time. Furthermore, teachers were well supported to teach online through existing support structures. As put by an interviewee,

“It’s the best we can do at the moment, it works and it is better than before but we all long to go back to the real classroom”

Similarly, in the case study visit in Romania, both education institutions visited (a primary school and a university) were using digital tools in the practice of teaching and learning for around 10 years before the start of the COVID-19 pandemic. Because both institutions are very mature in using digital learning tools, the shift to the emergency remote teaching during the COVID-19 pandemic was a relatively fast and smooth process. In fact, the two educational institutions visited commenced their digital education journey about ten years ago. Both institutions have addressed the digitalisation agenda in their strategic planning documents. Furthermore, both institutions have invested in providing both the technical infrastructure and support for digital teaching and learning in face-to-face classrooms long before the arrival of the COVID-19 pandemic. Their institutional level strategies and action plans include continuous improvement of the quality of the digital infrastructure and the digital competences of students, teachers and education personnel and administrative staff.

In both institutions, training for teachers and education personnel in connection with the development of their digital skills was already provided also before the COVID-19 pandemic. These supports addressed both the development of the technical level skills of using specific digital tools as well as the pedagogical deployment of digital tools with learners. Within the space of several months in the COVID-19 pandemic, many of these teachers succeeded were able to “go digital” due to the ongoing training, encouragement and help they received from the institution’s management and their more digitally skilled colleagues. This showed the resilience of staff to evolve their teaching practices to accommodate digital technologies to enable teaching, learning and assessment to continue remotely during this period.

“We shifted very fast (to online learning), as we already had the skills and digital platforms to continue our teaching and learning activities. However, that was not the case with many other educational institutions in Romania.”

2.2. Challenges faced by teachers and other education personnel in responding to the COVID-19 pandemic

Challenges in addressing the need to quickly move the teaching online were also highlighted in the project research activities, including a range of factors:

- **School digital maturity** was a factor in responding to the pandemic: well-performing schools before the pandemic excelled in using digital tools also in face-to-face teaching, whereas less performing schools struggled to adapt. Some respondents highlighted the differences in response quality between public and private schools, with the latter faring better in the response. In this sense, the pandemic served to highlight the gaps in resources and the need for investment in infrastructure. The crisis further amplified the gaps regarding the diversity of digital access, digital literacies, access to software and content, and the availability of supportive online communities.⁸
- **The lack of technical digital infrastructure** which included the lack of physical devices, lack of internet access and adequate connection levels, lack of microphones and headsets, lack of public platforms for online learning, as well as the lack of secure private networks to protect personal data of students and staff. The technical obstacles were especially challenging for students from disadvantaged backgrounds who had to share computers or faced problems accessing the internet.
- Both staff and students did not possess **adequate digital skills to teach and learn online**. In the case of staff, this can be linked to a lack of initial and continuous professional development. In this way staff were not sufficiently prepared before and during the pandemic, so that they were not able to adequately adapt their existing practices to move online overnight.⁹
- The pandemic increased the **workload for educational professionals**, in terms of preparing digital format teaching and learning materials, lesson plans and correcting the student work. In the words of one survey respondent, "With existing staffing levels it was very difficult to offer full provision"
- **Pedagogical concerns**, including:
 - Lack of pedagogical tools and contents and software packages adapted for online / blended learning;
 - Reflecting the different ages of children and young people taught, with younger children struggling especially to be addressed: *"Schools and colleges for 16+ are likely to keep online learning platforms for homework and for when pupils are at home for other reasons, and can still work, but younger age groups - primary schools in particular - have struggled to take this way of teaching and learning work. After all, the teacher-pupil classroom relationship is central to the young child's learning."*
 - The challenges of offering concrete activities requiring laboratories or applied online learning.

8 See also Stelitano, Laura, et al. "The Digital Divide and COVID-19: Teachers' Perceptions of Inequities in Students' Internet Access and Participation in Remote Learning. Data Note: Insights from the American Educator Panels. Research Report. RR-A134-3." RAND Corporation (2020).

9 This is also echoing the findings of other research, such as 2018 International Computer and Information Literacy Study (ICILS), see [Main findings and implications for education policies in Europe from the 2018 IEA International Computer and Information Literacy Study \(ICILS\)](https://www.ief.org/publications/2020/04/main-findings-and-implications-for-education-policies-in-europe-from-the-2018-iea-international-computer-and-information-literacy-study-icils/). ([europa.eu](https://www.euroopa.eu))

In this context, the case study findings further demonstrated the significant challenges faced by education systems on the ground in responding to the COVID-19 pandemic.

The interviews in Denmark showed that the students and teachers are increasingly demotivated, frustrated and have problems with concentration (monitor fatigue) and are tired of online teaching in the emergency context and long to return back to the physical classroom environment. In this way, the prolonged lockdown is having a negative impact on students and their learning experiences. There is no sense of community at school, as was previously the case before the pandemic. This is also expressed in the words of the stakeholders:

“Our students miss each other and the social interaction, which is also part of the education and being at school.

This pandemic teaching showed that no amount of digital tools can replace the teacher”

The experience of students in Denmark with digital tools in the COVID-19 pandemic had a detrimental effect on motivation and the level of materials absorbed. In the words of stakeholders interviewed,

“Motivation is at the rock bottom level now, we also don’t have the fundamental knowledge of many subjects anymore”.

In the Romanian case study, it was reported that before the COVID-19 pandemic, some of the teachers and education personnel in schools and at university were reluctant to use digital tools. This was usually down to a preference for face-to-face education methods or because they lacked the necessary digital competences. In both institutions, teachers and education personnel had received training for development of their digital skills before the COVID-19 pandemic, relating both to the technical level skills of using specific digital tools as well as the pedagogical deployment of digital tools. This knowledge and skillsets enabled many teachers to “go digital” rapidly in the pandemic context, due to the ongoing training, encouragement and help they received from the institution’s management and their more digitally skilled colleagues.

2.3. Support provided to the educators in the response to the COVID-19 pandemic

Furthermore, around 70% of national members were of the view that **the education authorities provided a positive response to the COVID-19 pandemic**, with EFEE members having a much more positive view on this aspect (see Table 2). A lower number, around 60%, considered that **education system staff were well supported** in the pandemic-induced changes, with EFEE members also having a much more positive view on this aspect.

In this context, a number of concrete **examples of swift and targeted support** from the education eco-system (including the ministry of education, centres of continuing professional development and NGOs) were highlighted in the online survey (see Box 1).

Box 1: Examples of support to educational personnel

Cyprus: The Ministry offers online seminars for teachers of all levels on an everyday basis, regarding the use of electronic platforms and software to offer online teaching, and, also on an advanced level, on how to use new technologies for the online teaching and learning. In addition, electronic guides and videos have been uploaded to help all teachers, parents and students use technology for their online teaching and learning.

Ireland: The INTO provided support to teachers through guidance documents, clarity on leave options and helpline. ICT Training was provided by the Professional Development Service for Teachers (PDST). Some online platforms (such as Twinkl.ie) made their resources/materials available free of charge to teachers. The Teaching Council co-ordinated a series of "Learning for All" webinars for teachers. Well-being events were hosted online to support teachers and promote both mental and physical health.

Montenegro: On 23 March 2020, the Ministry of Education started applying the new concept of distance learning. The #LearnAtHome Project involved recording and broadcasting lectures, in accordance with the curriculum, from 17 subjects. About 1,700 lectures were recorded. 182 teachers from 35 schools participated in the realisation of the #LearnAtHome Project.

UK: A range of online videos etc. were shared to support children's learning, e.g. white Roas maths which was already used by a lot of primary schools, Oak National Academy lessons, BBC bitesize and so on. In secondary schools, lessons were provided in various formats, and for all, teachers contacted students and families by email and/or phone.

Source: project survey.

At the same time, the national support materials and guidelines did not always align with the local situations on the ground. The survey respondents highlighted the following issues:

- Measures were decided at the national level, **not always reflecting the regional and local circumstances** of education institutions on the ground, suggesting a disconnection between the national level of decision-making and local context at particular education institutions.
- Guidance, manuals and regulations on how to address the pandemic reaching education institutions from the central level were general without detailed instructions. One respondent noted, *"The Ministry of Education plays a very passive role. They have published some manuals and guidelines ... (which) are sometimes too vague to be used ... The school directors say that they would appreciate some support from the state ... they also want clear rules and legal certainty for their work"*. There was also a delay in the publication of such support documents, and communication of important information was sometimes too late to be of use to school leaders and teachers (school staff often commented on the need for more timely information).
- **Financial resources were not always available** to support education personnel who had, on occasion, to use their own funds and own resources to buy devices or pay for training on online teaching.

It is also positive that **most of the education institutions were at least partially prepared** to address the impacts of the pandemic and move to online /blended education (see Figure 1). Exactly half of the respondents in the survey reported this partial readiness, with a small proportion of 14% reporting a good level of preparedness. However, in around a **third of cases the education institutions were not prepared** to move to online/blended education which is clearly an indication of the significant extent of challenges faced in such contexts.

This level of preparedness of education institutions was also demonstrated in the case study findings.

All institutions visited in the case studies in Denmark and Romania were extensively using digital tools before the pandemic, and thus were better equipped to move to emergency remote teaching, with educators having the requisite skills and adequate technical infrastructure and support.

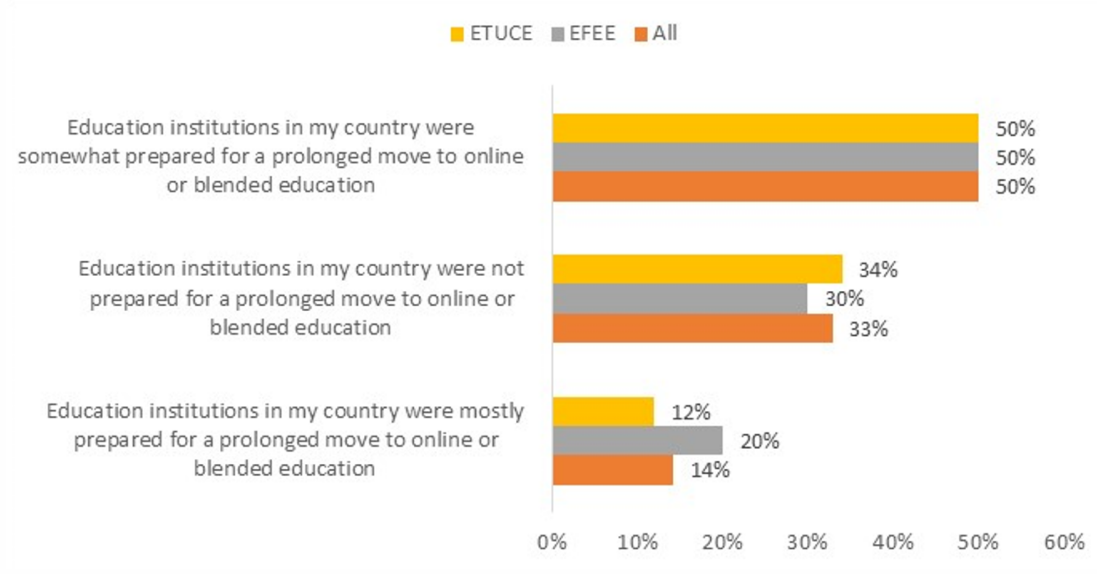
In Denmark, in the case study school visited, the reason for a quick adaptation to the emergency remote teaching in the school visited was a multi-year project¹⁰ before the COVID-19 pandemic, elaborating on how to develop digital practices in teaching and to adopt other and new ways of working and teaching. Participation in this project was a key factor in their successful engagement with teaching in the pandemic context. The first year, the new ways were pioneered with a core team of teachers, and the second year it was rolled out to other teachers, including internal training courses between peers and colleagues, and in the third year more teachers took part in it across the school. Without this large-scale three-year school development project, the school would not have been ready to respond so quickly to the move to emergency remote teaching. The school developed the project autonomously without the input of external institutions, and it was seen as part of the overall development vision for the school. Some teachers were initially sceptical about the use of digital education and had concerns about how this would fit into the overall Bildung mission. This refers to a critical perspective and thus teachers were questioning if the adoption of digital technologies would impact positively on the student learning. This was overcome through training and support from other colleagues.

The key challenges in providing support to the teachers and education in the COVID-19 pandemic highlighted by the survey respondents include:

- Differences in the level of readiness between distinct types of schools have been evident, with most private schools being well prepared in contrast to most public schools. Also, secondary schools were better prepared compared to primary schools, and they were more suited to moving online because of the age profile of their learners. Another distinction raised in the survey was between rural and urban schools, where at least better internet access was available.
- Limited time and insufficient financial resources for providing training and infrastructure investment as many institutions were lacking basic equipment, facilities, internet access, skills, capacity and training to reinvent themselves to offer online learning. "Both the infrastructure and the skills and competences of teachers and students needed to be upgraded in order to cope with the new and sudden situation.
- Lack of clear rules and national standards (beyond the basic principles) on how blended and/or online education should be delivered in practice, on which platforms, using which learning materials.

¹⁰ See [Digital dannelse - Køge gym \(kogegym.dk\)](https://www.kogegym.dk)

Figure 1: Do you consider schools and other education institutions in your country were ready for a prolonged move to online or blended education?



3. Key challenges and opportunities posed by digitalisation in education

KEY FINDINGS

- Digitalisation is successful when approached as an integral part of the overall educational mission

The consensus view on the **key challenges** arising from digitalisation in education were as follows:

- The negative social impacts and costs of digitalisation
- The intensification of teacher workload
- Health and safety challenges

Main **opportunities** arising from digitalisation in education are considered to be:

- Good opportunities for individual learning and empowering learners to engage in self-directed learning
- Digital tools being more attractive to at risk students in danger of leaving school early
- Few saw saving administrative costs as a main opportunity

3.1. Digitalisation as an integral part of the educational mission

A central finding from both case study visits in Denmark and Romania relates to the approach prevailing in the education institutions visited that **digitalisation is an integral part of the overall education vision**, mission and philosophy of educating young people and helping them to become active, critical and informed citizens in European societies.

The Danish case study visit showcased how digitalisation in education is steeped in the broader special Danish education tradition of **Bildung**, a didactic and pedagogical concept referring to the holistic framework for education and formation of young people. Education is seen in the Danish Bildung tradition, not just teaching a single subject and preparing students for future studies, but also developing their personal and general

competences to become analytical and critical students. Digital education is seen as an integral part of the education mission to enable students to grow their critical and self-reflection skills. Digital education is part of the overall Bildung educational philosophy in the school, to make students critical and active thinkers and citizens and persons who can act, discuss and participate in a democratic society. Digital education is part of the education of students to become an educated person and is not seen as a separate goal or form of education. This is seen as important in supporting students to become critical and analytical citizens in the digital age. Digital education is both new ways and approaches of delivering education through the use of digital tools and a formation of students in a broad sense of the word to enable them to become democratic citizens, helping the students to understand who they are in the digital world. Therefore, digital education is critically viewed within the Danish Education System as a component within the broader education system.

As put by one interviewee, *"In the climate of fake news and where we see a move towards post-factual society, we need to educate our students to be analytical and critical when they use and consume news on social media or other digital platforms "*

- **Digitization as formation (bildung)**

Teaching concrete ways of using hardware and software as well as promoting a critical consciousness in the students. Reflections on the ways the digitization of our selves and our lives have impacted the way we understand ourselves and others

Thus, digital education and the use of digital tools in the classrooms is not seen in Denmark as the end in itself, with the aim of putting the digital tools into the classrooms for their own sake. It is an integral part of the overall pedagogic approach to educating young people.

Similarly in Romania, the study visit participants defined the use of digital tools as an integral and necessary part of modern education as they help educational institutions in fulfilling their educational and pedagogical missions. In the institutions visited, the importance of using digital tools in an integrated way is part of an overall pedagogical approach. This was recognised in the two case-study institutions where they have spent almost 10 years embedding digital technologies into their teaching, learning and assessment practices. In both institutions, the digitalisation of education is viewed as an integral part of their pedagogical approaches, and the technologies are used to ensure that young people attain their educational goals in a modern, effective, attractive and appealing way. This is done in a thoughtful way to complement "traditional" ways of teaching, learning and assessing, where the teacher is central to the dissemination of knowledge.

This approach is illustrated well by the following quotes from the interviewees:

"Given the increasingly digitalized world we live in, digitalization in education is no longer a possibility but a necessity."

"Digital tools are very useful in education as they complement, and in some regards even supplement traditional education."

"Our strategic goal is better education, and for that we make use of all tools, including digital."

This positive approach to digitalisation in education can be contrasted with the more negative findings from the online survey of EFEE and ETUCE national affiliates who were asked to consider the overall situation in terms of digitalisation in education, beyond the immediate priority of addressing the challenges of responding to the COVID-19 pandemic. In this context, respondents were asked to share their views on the key challenges and opportunities for the education sector from digitalisation in education. As shown below, there was a strong consensus about the challenges of digitalisation in education (including the social costs, intensification of workload, concerns over health and safety), and less diffuse views about the opportunities offered by digitalisation. This contrast indicates that the more mature education institutions tend to embrace the digitalisation agenda, however, more support is needed across education institutions for all to benefit from the opportunities offered and address the challenges of digitalisation.

3.2. Challenges of digitalisation in education

Indeed, online survey respondents had a very clear view of **the challenges of digitalisation** of education for their sector (see Table 3). In the first place, the consensus pointed out the key significance of challenges relating to the **"social and pedagogical costs"** of digitalisation (by around 70% of respondents). This included the loss of social contact with colleagues and students, and students at risk of early school leaving, and importantly increasing inequalities between students. In this context, it is important to point out that around half of respondents fear the loss of motivation for learning amongst students, which of course would increase the inequalities further. These comments apply to the digitalisation of education during the emergency remote teaching and therefore need to be carefully considered in the wider context of digitisation in education in the post COVID-19 context when teachers and students return into the classrooms.

In this context, the case study findings **in Denmark illustrate how learners themselves perceive that learning using digital tools can have negative effects** in terms of learning outcomes if not applied appropriately.

According to learners interviewed in Denmark, in some subjects digital tools are perceived to make sense, where special digital programmes can help students to learn better, for example in mathematics or physics. However, digital platforms may also hinder student learning, as it is also good to learn things visually and from listening to teachers live in a class environment. For example, reading is considered to be much better in a book rather than on screen, where the students cannot take notes or make in depth reflections. Sometimes, students remember things better if they work by hand, rather than looking at the screen. If students are in the classroom already, it does not always make sense to use digital tools in addition to the more traditional tools. This shows how important it is that the **teachers are equipped with the knowledge and skills to make decision around when to use digital tools and to be clear why it is the preferred approach.**

There is not necessarily an important difference between the younger and older teachers using digital tools, but more by individual subject. For example, in maths or chemistry the digital tools are used a lot and make things easier to understand for students (such as making graphs or doing calculations), whereas in subjects where there is a significant amount of reading, such as in the social sciences, the students prefer to use physical books and take notes by hand, as in this way they remember things better. So, for assignments it is useful to use certain digital tools while others are less useful, depending largely on the subject and mode of learning (individual/group). In other words, learners reported that digital tools can be complicated if they are applied too much, sometimes it would be better to work on paper and pencil. The conclusion drawn here from the testimonies is that **the use of digital tools depends on the context, the subject area, the topic, the resources available and how the teacher plans to design the learning experience**. Ultimately, the teacher needs to consider the context and make a decision that is best for the learning situation and the learner. This is well illustrated by the following views from the interviewees:

"the devices we use is not the most important, what is the important is that teachers talk to us and explain things, and we then use digital tools in groups afterwards for example. It is very good that we can use devices sometimes but we don't have to use them all the time.

When there is a lot of reading involved or instructions, I prefer to learn it from a teacher directly rather than watching a Youtube video. I learn better and more when somebody explains it to me.

Digital tools can be smart, fun and fast because I can quickly find an answer, but that can backfire as well. For group work, it can work well because we can all work on the same document, but then we forget to talk about what we write. So it becomes more difficult to communicate online as we lose out on some aspects of group work. "

Similar pedagogical and learning concerns were also expressed in the case study visit in Romania.

From a more negative perspective, the stakeholders interviewed in the case study visit also reported that using digital education tools can be demotivating, if the digital tool does not match the learning style of the learner and if they are spending too long interacting with a computer screen (especially during the extended emergency remote teaching in the context of the COVID-19 pandemic). In addition, some considered that their use can lead to social isolation; learning assessments can be less accurate as they are more theory-based; technical issues can interrupt the process of online based assessments (such as disruptions to the internet connection); teachers needing more time to prepare teaching content that is interactive and can attract and keep students' attention. As put by interviewees,

"In a normal classroom, teachers can have physical contact with pupils and watch over them, checking how they write, how they manage with their assignments, and give them feedback and help right away. We cannot do that in an online activity."

"We could not stick to the classical curriculum in online teaching. We made the online classes more practical and interactive so we could keep pupils awake."

"I don't like it when we have technical issues such as some device doesn't work or there is no internet connection, and that we cannot socialize as well as when we are face-to-face."

The second important challenge relates to the educational personnel themselves and the challenge of **intensification of workload**, which saw them work longer hours and a deteriorating work-life balance due to increased digitalisation in education (around 60% of respondents). Indeed, the experience of the pandemic led to changing work practices and workload of teachers, at all levels, using digital tools. During the pandemic, this workload increased dramatically, and education personnel went above and beyond the call of duty to keep learners engaged. The key question for the future is how **this will evolve in the post-pandemic context and whether the increased use of the digital tools will 'transform' work practices and the level of workload for education personnel in the long term.**

There were also significant concerns relating to **health and safety** (such as increased stress or risks associated with increased screen time) as well as ensuring the protection of personal data and privacy of staff and students, which was pointed out as a challenge by around 50% of survey respondents. 40% of respondents considered the challenge of cyber bullying and harassment as also being very important. In contrast, comparatively fewer respondents considered that digitalisation challenges the professional autonomy of education system staff and the academic freedom of researchers and academics.

Table 3: What are, in your organisation's view, the main challenges of digitalisation in education, for your education sector?

	Not important at all	Not very important	Somewhat important	Very important	Very important, % total	N*	Total
Loss of social contact with colleagues and students		3	14	52	74%	1	70
Increased inequalities between students		4	12	51	73%	3	70
Loss of contact with students at risk of early school leaving		5	16	47	67%	2	70
Intensification of workload		5	17	45	64%	3	70
Longer working time		7	18	44	63%	1	70
Risk of deteriorating work-life balance for teachers, trainers, school leaders, academic staff, and other education personnel	2	5	18	44	63%	1	70
Health and safety concerns, such as work-related stress, increased screen time	1	4	23	40	57%	2	70
Loss of motivation of students	1	7	22	37	53%	3	70
Risk of data protection infringement	2	10	23	34	49%	1	70
Decreased privacy	3	12	23	30	43%	2	70

	Not important at all	Not very important	Somewhat important	Very important	Very important, % total	N*	Total
Risk of creating a two-tier teaching profession (those who have access to technology, the competences or digital capacity to use these technologies and those who do not)		11	30	28	40%	1	70
Cyber harassment and bullying	3	6	32	28	40%	1	70
Danger of decreasing teachers', trainers', school leaders', academic staff, and other education personnel's professional autonomy	5	23	16	25	36%	1	70
Danger of decreasing the academic freedom of academics and researchers	9	25	20	15	21%	1	70

Source: E-speed project survey 2020. * no response. Multiple choices were possible.

3.3. Opportunities offered by digitalisation in education

The views on **the opportunities were more varied compared to a broader consensus on the challenges of digitalisation (see Table 4)**. The main opportunity in terms of its importance seen by 50% of online survey respondents was **the digitalisation offering an attractive and modern way of teaching and learning**. This suggests that members see a need to modernise and transform the teaching practices to better meet the needs of the 21st century. Beyond this, views on the potential opportunities diverge, also possibly indicating a lack of understanding and the influence of emergency remote teaching in the pandemic context.

Core advantages, as seen by around 40% of respondents, relate to digitalisation providing **good opportunities for individual learning and empowering learners to engage in self-directed learning**¹¹. Another core opportunity relates to increasing access to and inclusiveness of education also helping to make learning more attractive to learners at risk of early school leaving. In this way, digitalisation could also play a role (in combination with new pedagogical approaches) to improve the learning outcomes of individual students.

In contrast, fewer respondents considered that digitalisation offers opportunities to increase professional autonomy of staff and academic freedom. The positive impact of work life balance was also not considered to be a major opportunity, also potentially due to the related negative experiences in the pandemic context. This is in line with the findings above where these challenges were highlighted as arising from digitalisation.

¹¹ This is echoing other studies which show the potential of digital tools to contribute to better learning outcomes, see EENEE (2019), Education outcomes enhanced by the use of digital technology. Reimagining the school learning ecology, Luxembourg: Publications Office of the European Union.

Perceived benefit of increased digitalisation is its potential to save administrative costs using modern technologies in school and education institution administration and management processes. This is not supported in the survey findings. Cost savings were not seen as an especially important opportunity across survey respondents where only 34% considered this to be a very important opportunity. To some extent, such responses could be expected from teachers who are primarily not concerned with such issues. However, this is an important issue for management and school leaders

Table 4: What are, in your organisation's view, the main opportunities of digitalisation in education, for your education sector?

	Not important at all	Not very important	Somewhat important	Very important	Very important, % total	N*	Total
Offering an attractive and modern way of teaching and learning	2	7	24	35	50%	2	70
Digital tools offering opportunities better individual learning	2	13	21	32	46%	2	70
Increasing access to and inclusiveness of education	5	13	18	32	46%	2	70
Offering an attractive and modern way of assessing students	3	12	24	30	43%	1	70
Making learning attractive to those who are at risk of early school leaving	6	15	15	30	43%	4	70
Enhancing practical/project-based learning to better prepare learners for the modern world of work and life	6	8	25	29	41%	2	70
Empowering learners to engage in more self-directed learning, problem-solving etc.	4	8	29	28	40%	1	70
The use of digital tools in education may increase the learning outcomes of individual students	7	11	21	28	40%	3	70
Enabling more collaborative learning for students	4	13	26	26	37%	1	70
Increasing teachers', trainers' and other education personnel's professional autonomy	3	17	24	25	36%	1	70
Enhancing work-life balance, as regards working time, of teachers, trainers, school leaders, academic staff, and other education personnel	5	14	25	25	36%	1	70

	Not important at all	Not very important	Somewhat important	Very important	Very important, % total	N*	Total
Saving administrative costs through the use of modern technologies in school and education institution administration and management processes	11	15	19	24	34%	1	70
Strengthening the academic freedom of academics and researchers	6	20	24	19	27%	1	70

Source: E-speed project survey 2020. * no response. Multiple choices were possible.

In this context, it is telling that the education institutions visited in the case study visits in Denmark and Romania have identified a range of benefits from a critical and teacher-driven use of digital tools in education. In this sense, in contrast to the survey the case-study respondents did see benefits, and these differed significantly from benefits captured in the survey. Also noteworthy is the fact that the case study in Denmark was at the secondary level, where learners are expected to be more self-directed and this contrasted with Romania, where the learners were younger. This also showcases that **the education context is critical in deciding how and where to use digital technologies.**

In Denmark, the stakeholders interviewed in the case study visit have identified a range of benefits associated with the use of digital tools in education. They include the following aspects.

Digital education and the use of digital tools enables **a more active role of students** in the learning processes with more participation, more contribution and better interaction between the students. Digital tools can empower students to participate more actively compared to more traditional ways of teaching, where *“only one student would be answering the teacher’s question, now they have to be active participants when using digital tools correctly and it is very visible when they do not answer and participate”* (in the words of one interviewee).

Through the active use of digital tools, more students are motivated to participate, including those who would be more reserved to come forward in non-digital settings. When the students have to participate continuously using digital tools, this typically encourages higher levels of participation. Overall, the use of digital tools has improved the learning process for students, helping with motivation, reducing dropout rates and getting students more engaged in their learning. The interviews did not capture any patterns of non-engagement with digital tools among certain learner cohorts with the exception of a group of high achieving girls who find the more traditional way of teaching more appropriate.

At the same time, the stakeholders interviewed were also clear that digital education or digital tools alone cannot fix educational problems or help students who already had learning problems. If students have problems learning at school already, then digital tools will not provide a magical solution to address pre-existing challenges. However, when combined with other interventions they may play a role in addressing the underlying challenges.

Digital education and the use of digital tools offers **smarter and more collaborative ways to work and interact** with and between students which reflect the current realities of young people's lives outside of school. Digital tools can better support student collaboration in more interactive ways. This increases the appeal of learning approaches to young people and thus can support their motivation and engagement with learning materials.

The use of digital tools has the potential to **transform the role of teacher**, from a traditional perception of the knowledge transmitter towards a role of a tutor and enabler, playing a more supportive role to student learning, facilitating collaborations, and assisting to better integrate written and oral work. This can be quite challenging but the respondents indicated that their use of digital technologies cast them more in the role of a facilitator and designer of learning than in the role of someone purely disseminating or transmitting information to students. In this role, they use technology to support more active forms of teaching and learning, where students are engaged in a wide range of learning experiences.

Digital tools can also help certain students with additional learning needs, such as dyslexic or blind students, whose learning experience can be greatly improved by digital tools. In such cases, digital technologies allow them to participate actively in their own learning by providing them with alternative access to content or providing them with a voice. As expressed by one interviewee,

"in a normal world outside COVID, you can use digital tools to support normal education in a very good way and it is a good support"

An **interesting benefit highlighted in the case study visit to Romania related to the increasing role of parents in the primary schools' transition to online education**. This again highlights the educational context - as this is not a finding to expect in secondary schools and higher education contexts. Parents played an important role in ensuring that digital tools were used appropriately in the primary school setting. This was highlighted by the stakeholders in the primary school visited during the case study. In particular, they played an important role ensuring primary school students engaged effectively with the move to online education. During this process, parents became more engaged in their children's education, and parent-teacher connections have been strengthened because of the emergency remote teaching. The interviewees reported that parents were extremely helpful and supportive during the online education through ensuring that students actively participated, by helping them access and use digital platforms and in solving any technical issues. One primary teacher observed that parents learned more about their children's learning by observing their performance online. As a result, they learnt more about the engagement, interests and abilities of their children and help them with their homework and catching up with the content, and importantly guided them through their challenges. An unexpected side effect of parental involvement during the emergency remote teaching was that parents became aware and more appreciative of the role of the teacher in their children's learning. This is shown by the following views from the interviews:

"The digital education tools we used made the link with the parents alive, and the parents more involved in the learning process. The online education was in a way a school also for parents, not only for pupils. Parents were also very supportive and helpful in handling technical difficulties."

"Through digital tools used in the teaching now, parents appreciate much more how hard and demanding the job of the teacher is".

Stakeholders in Romania identified also other benefits from the use of digital tools in education processes. Among the reported advantages of using digital tools in education were that they enable fast access to a vast array of information, executing tasks more accurately and efficiently, visualizing concepts and processes and thus making them easier to understand, and the possibility to communicate and collaborate with other learners, or teachers from distance. As put by interviewees,

“Digital tools provide an easy access to information and help to do things faster and more accurately.”

“We used digital education tools before the pandemic, as they save time and energy.”

“Digital education makes it easier to involve guest lecturers from other departments and universities.”

4. Importance of digitalisation in education policies

KEY FINDINGS

- Clear consensus amongst the ETUCE and EFEE national members that the digitalisation is a very important policy priority, which is translated into the pedagogical policy and allocation of funding.
- Less strategic and policy level activity on digitalisation.
- A mixed view on the extent of the education personnel having a strong voice in digital education policy.

An important area investigated in the project related to how far the strategic and operational education policies reflect the agenda of digitalisation in education.

4.1. Digitalisation and strategic education policy

The results of the online survey show that the education policy makers are recognising the importance of digitalisation of education and developing policy level responses.

Overall, for the majority of ETUCE and EFEE national members this is **a very important policy priority**.¹² Nearly 90% of respondents (see Table 5) confirmed that for their organisation addressing the challenges and opportunities for digitalisation in education is significant and/or very significant. The views of ETUCE and EFEE members were similar in this regard.

Table 5: How significant is addressing the challenges and opportunities for digitalisation in education in your organisation?

	Neutral	Not very significant	Significant	Very significant	% of significant	No*	All
Both	5	1	29	33	89%	2	70
EFEE			6	14	100%		20
ETUCE	5	1	23	19	84%	2	50

Source: E-speed project survey 2020. * no response.

¹² This is also echoed in other studies, see Conrads, J., Rasmussen, M., Winters, N., Geniet, A., Langer, L., (2017). Digital Education Policies in Europe and Beyond: Key Design Principles for More Effective Policies. Redecker, C., P. Kampylis, M. Bacigalupo, Y. Punie (ed.), EUR 29000 EN. Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79- 77246-7, doi:10.2760/462941, JRC109311.

Probing further, different aspects of policy responses to digitalisation have been emphasised to varying degrees.

On one hand, the majority of survey respondents indicated (over 60%, see Table 5) that **digital education is reflected in the pedagogical policy** – such as in the curriculum documents and training of educational personnel (on how to include digital tools in education). Importantly, nearly 60% of respondents also indicated that **funding has been allocated** to enable the implementation of a digital education agenda.

Case study findings from Denmark and Romania illustrate further how digitalisation in education has been reflected in the pedagogical policy in practice.

The regulatory framework for the Danish upper secondary education is set down in a joint executive order governing general and vocational upper secondary education. It lays down the framework for teaching as well as some overarching substantive components, including working with students' global, innovative and digital skill-sets or competences. The requirements for digital competences are described in Section 29(6):

"Students shall achieve digital competences so as to learn to adopt a critical view of digital media and form part of digital communities.

In their subjects, students shall learn to search for information and take a critical view of sources when searching for knowledge through digital media, and through their teaching students shall gain experience of digital communities and work on the creation of digital products."

Indeed, this is an important aspect as it **moves beyond teaching digital skills separately but rather embedding them in subject teaching**. This also addresses the wider issue of digital literacy. In its guidelines on the executive order, the Ministry of Children and Education recommends that schools draw up an overarching strategy for each school on the development of students' digital competences. Among other things the strategy must contain a progression plan for students' development of digital competences in their subjects.

The regulatory framework for the teaching of subjects in Denmark is the individual curricula ("subject schedules"), describing which competences students have to achieve in the subject and very general parameters for the content (core material) and organization of the teaching (working approaches). In this way ALL teachers are responsible for developing their students' digital competences and this will vary depending on the subject area. Students' digital competences are developed within the following subjects (as examples), showing digital integration or embedding in practice:

- Mathematics: work with more complex topics via CAS (computer algebra systems)
- Physics: digital virtual experiments that cannot be tested IRL
- Danish (native language teaching): engineering digital productions
- History: source-critical analysis of digital media, e.g. fake news
- Social studies: participation in political digital communities.

In Romania, in 2011, Information and Communication Technology training was added to the Romanian National Curriculum. Since 2012, digital competences training is a compulsory stand-alone subject for all students in lower and upper secondary education. This appears to be in contrast to Denmark where the development of digital competences is embedded across curriculum subjects. In addition, upper secondary education students take a national test to assess their digital competences. At the primary education level, students may develop their digital competences, as it is an optional subject that school can offer.

However, the online survey findings show that **the developments at the strategic level are less widespread** across the responding countries. Around half of all surveyed respondents indicated that their education sectors, higher education/research institutes and their countries have a formal policy on digital education. On this subject, the opinions of ETUCE and EFEE members have also diverged significantly, with ETUCE members having a much more positive view on this. Furthermore, in around half of the cases respondents reported having formal guidelines/implementation documents on digital education. While only 40% of all respondents indicated having formal policies on teachers, trainers, school leaders, academic staff, and other education personnel intellectual property (although here the views of ETUCE and EFEE members diverged significantly, with EFEE members having a much more positive view).

In this context, the example of strategic commitment to digitalisation in education from the case study in Romania provides an illustration of how this strategic approach happens in practice.

In Romania, the importance of digitalisation in education has been recognised at the strategic educational policy planning level. The Ministry of Education has treated the digitalisation in education as an important policy priority, supporting it with financial resources and investments into the technical infrastructure and training of teachers, as well as incorporating the development of digital competences into the school curriculum and teacher training curricula. Most recently, as part of the national Romanian plan¹³ in the context of implementing the EU level funding initiative, the 'Recovery and Resilience Facility'¹⁴, a dedicated budget will be allocated to the upgrading of digital infrastructures across the educational system and in further enhancing the digital competences of all teachers and education personnel. This shows that the teachers and education personnel in Romania have been working with the digitalisation agenda for at least 10 years, supported by the Ministry's investment in technical infrastructure, supports that include teacher education and student education/training in digital competences.

In addition, online survey findings show that existing digital education policies also do **not fully consider the new emerging technologies**, related to the digitalisation. This relates specifically to the use of Artificial Intelligence in education, where only 9% of respondents indicating having formal policies on the usage of AI in education. This raises other issues, such as what should be included in such policies addressing the AI and the new emerging technologies. The issue is increasingly receiving attention at the policy level. Furthermore, a recent OECD report examined how the newly emerging technologies can change education in the classroom and support the management of education organisations and systems.¹⁵ It concluded that artificial intelligence (AI), blockchain and robotics have a strong potential to accelerate Europe's development and support the education of the next generation of professionals.

13 See [PLANUL NATIONAL DE REDRESARE SI REZILIENTA \(PNRR\) \(gov.ro\)](https://www.gov.ro)

14 See [Recovery and Resilience Facility | European Commission \(europa.eu\)](https://ec.europa.eu/economy_finance/)

15 See [OECD Digital Education Outlook 2021: Pushing the Frontiers with Artificial Intelligence, Blockchain and Robots | READ online \(oecd-ilibrary.org\)](https://www.oecd-ilibrary.org/)

4.2. The voice of educators in shaping digitalisation policy agenda

The survey data found that there was a mixed view among education personnel in relation to having a strong voice in developing the digital agenda. Only 40% of respondents indicated that teachers have a voice in shaping the agenda (see Table 6). Here, the views of EFEE members are significantly more positive. 70% of EFEE members considered that personnel have a strong voice, compared to the less positive view of ETUCE members where only a third of respondents confirmed this is the case.

Table 6: Positive response on a range of aspects of digitalisation policy

	Both	EFEE members	ETUCE members
Digital education is referenced in the curriculum documents for your sector(s)	63%	65%	62%
Teachers, trainers, school leaders, academic staff, and other education personnel's training includes pedagogical methodologies using digital tools in education	61%	75%	56%
Funding has been allocated to enable your sector(s) to implement a digital education agenda.	57%	60%	56%
Education sector(s) covered by your organisation have a formal policy on digital education	51%	30%	60%
Your country / region has a formal policy on digital education	51%	30%	60%
Your higher education/research institute has a formal policy on digital education	49%	40%	52%
There are formal guidelines/implementation documents on digital education for your sector(s)	49%	45%	50%
There are formal policies on teachers, trainers, school leaders, academic staff, and other education personnel intellectual property	40%	65%	30%
Teachers, trainers and other education personnel have a strong voice in shaping the digital education agenda for your sector(s)	40%	70%	28%
There are formal policies on the use of Artificial Intelligence in your education sector(s)	9%	5%	10%

Source: E-speed project survey 2020. % of respondents answering "yes" to the question.

5. Using digital technologies in the education system

KEY FINDINGS

- Digital technologies are partially used in teaching, learning and assessment of students by teachers in the pre-COVID context with a limited digitalisation in education processes prior to the pandemic, especially in the face-to-face teaching contexts.
- Education personnel are ready to use the digital tools.
- A significant gap appears in relation to professional training as education personnel have not received effective and quality professional training in digital pedagogy, including quality professional training on how to use internet and communication tools for online or blended teaching.
- Private companies play a pivotal role in developing and providing digital tools and devices for online / blended teaching and learning.
- There was significant consensus on the types of investment required to ensure optimal development of digital education: the need to invest in skills and competences for education personnel, digital infrastructure, tools for students and education personnel.
- A minority of respondents reported using AI and yet AI is neither reflected in the training contents nor policy / guidance / documentation of many organisations and regions.

The online survey of national members of ETUCE and EFEE and the two case studies reflected on the practical day to day use of digital technologies in their education systems.

5.1. Digital tools in everyday pedagogical practice

To start with, the online survey shows the results of the partial **use of digital technologies** in teaching, learning and assessment of students (see Table 7). Furthermore, respondents identified that digital technologies were partially used in education systems prior to the pandemic¹⁶. Around a third of respondents reported that teaching, learning and student assessment are fully / mostly digitalised. This was most widespread in relation to learning processes (as opposed to teaching or student assessment). In contrast, around 70% of respondents considered that there was only a slight digitalisation of core processes in their education systems prior to COVID-19 pandemic.

¹⁶ This is also aligning with other research findings on the use of digital tools in European education systems, see ICILS data at <https://www.iea.nl/studies/iea/icils>

Table 7: To what extent are digital technologies used in teaching, learning and assessment in your education system?

	Fully digitalised	Mostly digitalised	% of fully and mostly	Not digitalised	Slightly digitalised	N*	All
Teaching	5	19	34%	1	43	2	70
Learning	5	22	39%	2	39	2	70
Student assessment	5	17	31%	7	38	3	70

Source: E-speed project survey 2020. * no response.

The online respondents also reflected on the different settings of where teaching and learning activities took place (see Table 8). The majority - nearly 65% of respondents pointed out, as expected, that online teaching and learning is fully and mostly digitalised. In contrast, this was less the case for face to face and blended education. Blended education was fully / mostly digitalised in nearly 55% of cases. **The lowest degree of digitalisation was reported for face-to-face teaching and learning (26%).**

Table 8: For what purposes are digital technologies used in different settings of teaching and learning in your education system?

	Fully digitalised	Mostly digitalised	% of fully and mostly	Not digitalised	Slightly digitalised	N*	All
Face-to-face teaching and learning	2	16	26%	9	40	3	70
Online teaching and learning	21	24	64%	2	19	4	70
Blended education [mix of face-to-face and online teaching and learning]	5	33	54%	1	29	2	70

Source: E-speed project survey 2020. * no response.

5.2. The critical and reflective use of digital tools in education

In the two case studies, the selected educational institutions provided rich examples of how **digital tools can be used pervasively and critically** in the everyday pedagogical practices of the teaching staff.

In the Danish educational institutions, all teachers are using digital tools in their teaching across the board. Predominantly, the use of digital tools is driven by the didactic and pedagogical purposes. This is due to the high extent of teacher autonomy enjoyed in the education system in Denmark. **The degree of autonomy** appears to be a major factor in how the teachers will adopt and use any digital tools as long as the teachers enable students to achieve the learning outcomes. This is a key finding, relating to high levels of teacher autonomy and critical decision-making on the teacher's part, not being dictated in relation to use of digital tools. Where teachers are competent and confident to make such decisions, they appear to critically consider the context and decide when, where and how to use digital tools. Accordingly, some teachers are very skilled and reflective in the use of digital tools. No significant patterns in the use of digital tools were reported in terms of age, gender,

or new/experienced teachers. Initial and ongoing teacher training has improved over the last 15 years, and teachers who have participated in such programmes are typically more skilled in using digital tools. This is further illustrated by the following interviewee comments:

“ Teachers have become better and better know how to work with these digital tools in their teaching and how to use them to their best benefit and also with specialised tools ”

Teachers have become very good in using meeting spaces like we use Google Meet which gives pupils the possibility to work together in small groups which is great if you have a class of 28 ”

None of the interviewees in the Danish case-study reported using European level digital tools, such as SELFIE, or having engaged in Erasmus+ projects with other EU countries. They reported using a range of tools which included tools such as Google drive, Google Meet and specialised digital applications.

Overall, the case study illustrated how important it is for educators to take a **critical and considerate approach to digital education**. Educators and students themselves appear to be very mindful about the added value of using digital tools and pursuing digital education in the education system. They did not believe that their presence may necessarily enhance student learning and some respondents displayed an ambivalence as to how much digital tools bring the teacher closer to the students or whether digital tools establish a greater distance between the teacher and the students. Views were also expressed as that the use of digital tools per se does not offer a quick fix or a fix for educational problems which already existed before, reflecting the overall tradition of *Bildung* in the Danish context. This suggests that educators in Denmark take a holistic and critical approach to digital education and that educational professionals are empowered to use these tools as they see fit.

Similarly, in the **Romanian case study, the interviewees reported that the pace and adoption of digitalization in education is not the same across educational institutions and subjects within their institutions**. This is highlighting the importance of **addressing the potential risk of creating a digital divide** (in terms of equipment, skills, access, training) amongst education institutions and teachers and education personnel, as it can leave those who are less digitally competent and confident further behind. This could manifest itself in digitally rich institutions and institutions where digital technologies are not used at all and this could negatively impact learners.

Prior to the COVID-19 pandemic, one of the Romanian educational institutions used digital technologies in approximately half of all teaching and learning instances with students. In the second institution, digital tools, such as interactive boards, TV sets, and laptops/multimedia were integrated to support teaching, learning and assessment practices. The level and type of uses varied by subject area. The interviewees observed that the use of digital education tools depends mostly on the personal motivation of teachers and education personnel and the nature of the particular subjects taught. Conversely, the use of digital tools in the pedagogical practice depended less on the age or gender of teachers and education personnel.

In both institutions visited in Romania, there was **an awareness of the European agenda on the digitalisation of education**, with multiple references made to the Digital Education Action Plan¹⁷ or the use of results from Erasmus+ projects across the interviews. For example, the higher education institution participates actively

17 See Digital Education Action Plan (2021-2027) | Education and Training (europa.eu)

in the mobility schemes for staff and students offered through the Erasmus+ programme. The primary school has participated in two Comenius projects and a number of individual mobility actions offered through the Erasmus+ programme. Stakeholders from both institutions illustrated an understanding of how digital education issues are tackled at the European level, while also showcasing how their participation in a range of European networks has enabled them to draw upon concrete results, processes and outcomes in the digitalisation of education.

Both educational institutions used a **range of digital platforms** that included Microsoft Teams, Google Drive, and a range of specialised in-house digital tools, which facilitate communication between teaching staff and management. The higher education institution is part of the Microsoft network for higher education institutions, demonstrating its high level of engagement in the respective digital education networks and platforms. The Microsoft platform is an innovative network that gives the educational institutions access to new tools and new approaches to digital education.

A major issue raised in the case study visit in Romania related also to the appropriate use of digital tools in the student assessment process. also reflecting their different use at the different education levels. Case study stakeholders reported that student assessment using digital tools has both advantages and disadvantages. In the two education institutions visited, the use of digital technologies to support a range of assessment practices differed across a range of criteria that included educational level and subject disciplines. At the university, the assessment process was more focused on the end of year summative assessments, whilst this was less of an issue for the primary school. In this context, the high stakes nature of such summative assessments also needs to be borne in mind.

As reported by some interviews, online assessments can consist of group projects, case studies, and presentations, which promote and emphasise students' creativity and critical thinking, as opposed to the learning processes that are focussed more on memorising and learning by heart. Indeed, such diverse assessment strategies typically differ from more traditional assessment approaches, such as a final written examination, that emphasises rote learning and memorisation. While digital technology has the potential to expand the range and format of assessments, **experiences during the COVID-19 crisis also highlighted a range of challenges.** This was particularly evident in higher education, where traditional on-site examinations were replaced by online examinations. In this context academic integrity came to the fore and institutions were forced to adapt existing practices, such as reducing the duration of online exams, to avoid student cheating. Students also must upload their timed exam papers, and they sometimes encounter technical issues with that. Interviewees reported that in such circumstances, digitally based assessment poses additional stress on students, and they can fail an exam because of technical difficulties, which makes such learning assessments challenging and possibly inaccurate.

Another problem with digitally based assessments is that sometimes they cannot assess students performing practice-oriented assessments such as laboratory activities due to the lack of equipment at students' homes. Such online-based assessments also had an impact on teachers and educational personnel, as they had to devote more time to transforming the existing types of assessments to digitalised formats, as well as modifying the pre-existing methods of assessments (an example was provided when the practical laboratory-based assessment had to be replaced by a more theoretical oriented assessment). This example highlights that some traditional forms of assessment, such as terminal examinations written by the end of the year, do not transfer readily to an online environment. Therefore, there is a need to critically consider if digital technology allows

to design new forms of assessment that are more ongoing and support multiple modalities in terms of video, images, audio etc. This also has implications for the continuing professional development of teachers, which should reflect this changing nature of the assessment.

The case study interviewees focussed on the use of digital tools in the summative assessment, and less so on the formative assessment, possibly also because this was challenging. This might be explained by the challenges and issues that summative remote assessment presented for the institutions. In contrast, formative assessment played less of a central role. Here, the potential of digital tools to help assessing the progress of learners during the learning process (as opposed to its end point) appears to require further reflection and exploration. Still, the digitalisation in the formative assessment should be the key aspect of digital education. As expressed in the interviews,

“Digital tools do not have good accuracy for assessing the knowledge and they need to be combined with offline assessment such as practical assessments in practice labs, especially given that my subject (chemistry) is based not only on theory but also on experiments.”

5.3. The main areas for further investment in using digital tools

Another important aspect relates to **who develops and provides digital tools** and devices for online / blended teaching and learning (see Tables 9 and 10). In both aspects, **private companies play a pivotal role, with limited involvement of education system stakeholders.**

In relation to the development of digital tools, over 70% of respondents indicated that private companies are predominantly developing digital tools (see Table 9). However, EFEE members are reporting this to be the case to a significantly higher extent compared to ETUCE members. Interestingly, in around a third of cases, public authorities work in partnership with private companies (here, more ETUCE members reported this to be the case, reported by 38% of ETUCE members, compared to 15% of EFEE members).

Furthermore, an important role is also performed by teachers, trainers and other education personnel training institutes and Higher education research institutions, as pointed out by around a half of respondents (with few differences between EFEE and ETUCE members). The other education system stakeholders are considered to play a much more limited role in the development of digital tools.

Table 9: Which actor(s) develop digital tools for online or blended teaching and learning in your education sector(s) (click all that apply)?

Type of actors:	Both		EFEE		ETUCE	
	Number	%	Number	%	Number	%
Private companies	53	76%	19	95%	34	68%
Public authorities and private companies in partnership	22	31%	3	15%	19	38%

Type of actors:	Both		EFEE		ETUCE	
	Number	%	Number	%	Number	%
Teachers, trainers and other education personnel training institutes	48	69%	14	70%	34	68%
Higher education research institutions	38	54%	12	60%	26	52%
Public authorities at national level	29	41%	10	50%	19	38%
Public authorities at national level in partnership with teachers, trainers and other education personnel	22	31%	5	25%	17	34%
Education employer organisations in partnership with teachers, trainers and other education personnel	14	20%	4	20%	10	20%
Education employer organisations	13	19%	4	20%	9	18%
Public authorities at local level	10	14%	1	5%	9	18%
Public authorities at local level in partnership with teachers, trainers and other education personnel	10	14%	2	10%	8	16%
All responses	70	100%	20	100%	50	100%

Source: E-speed project survey 2020. Multiple choices were possible.

In relation to providing digital tools, **over 80% of respondents pointed out the roles of private companies here** (see Table 10). However, EFEE members are reporting this to be the case to a higher extent compared to ETUCE members. Encouragingly, in around 40% of cases public authorities work in partnership with private companies (here, more ETUCE members reported this to be the case, 40% compared to 35% amongst the EFEE members). In this context, the key challenge is to ensure that the private companies developing digital educational tools reflect appropriately the pedagogical contents, mission and desired outcomes of the tools, as well as address key concerns over data privacy, security and balance interests of the profit-driven market orientation and public mission of the education.

In this context, an important role is also played by higher education research institutions and national level public authorities, as pointed out by around 40% of respondents. The other education system stakeholders are considered to play a much more limited role in the provision of digital tools.

Table 10: Which actor(s) provide digital devices for online or blended teaching and learning in the education sector(s)?

	Both		EFEE		ETUCE	
	Number	%	Number	%	Number	%
Private companies	56	80%	20	100%	36	72%
Public authorities and private companies in partnership	27	39%	7	35%	20	40%

	Both		EFEE		ETUCE	
	Number	%	Number	%	Number	%
Public authorities at national level	33	47%	12	60%	21	42%
Higher education and research institutions	29	41%	8	40%	21	42%
Teachers, trainers and other education personnel training institutes	25	36%	10	50%	15	30%
Public authorities at local level	14	20%	3	15%	9	18%
Education employer organisations	13	19%	3	15%	10	20%
All responses	70	100%	20	100%	50	100%

Source: E-speed project survey 2020. Multiple choices were possible.

The survey also revealed a **large consensus on the types of investment required to ensure optimal development of digital education** (see Table 11). Here, the views of ETUCE and EFEE members are remarkably similar. Around 90% of respondents pointed out the need to invest in skills and competences for education personnel, the digital infrastructure, and digital tools for students and education personnel.

Table 11: Which kind of investment, in your view, is necessary to ensure the optimal development of digital education?

	Both		EFEE		ETUCE	
	Number	%	Number	%	Number	%
Investment in skills and competences of teachers, trainers, school leaders, academic staff, and other education personnel	65	93%	19	95%	46	92%
Investment in digital infrastructure in schools and other education institutions	62	89%	19	95%	43	86%
Investment in digital tools for students	62	89%	18	90%	44	88%
Investment in digital tools for teachers, trainers, school leaders, academic staff, and other education personnel	61	87%	17	85%	44	88%
All responses	70	100%	20	100%	50	100%

Source: E-speed project survey 2020. Multiple choices were possible.

The survey further asked respondents to reflect on **the use of AI (Artificial Intelligence) in the education system**, both from the perspective of education institutions and education personnel (see Table 12). **A very small number of respondents are currently using AI in education, both in terms of educational institutions and personnel actively using such tools.** In contrast, around 60% of education institutions and 70% of personnel have rarely or indeed never used such tools. This shows the need to educate all personnel on what the AI is and how it can and should be used in the education systems.

However, this finding does not come as a surprise as education system stakeholders have not been empowered to use the AI. Around **70% of both educational institutions and personnel have rarely or never knowingly received guidance and training** on the use of AI technologies in education. Such guidance was available only in around a third of cases. At the same time, there is **a significant level of concern** in relation to the use of AI in education. Such concerns were reported (and potentially understood) by around 40% of educational institutions and 45% of educational personnel. This finding highlights the need for educational staff to constantly update their knowledge and digital competences around new and emerging technologies, such as AI. There is a growing list of new digital technologies that have the potential to enhance learning, but sometimes such products can have negative impacts for teachers and learners, and these need to be understood and addressed.

Table 12: What is the situation within your organisation in relation to the use of Artificial Intelligence in education? What main concerns have been raised about the use of artificial intelligence in education? (number of responses)

Schools, higher education and research institutions, and other institutions:							
	Always	Often	Sometimes	Rarely	Never	N*	All
-are actively using Artificial Intelligence technologies with their students	0	7	17	32	10	4	70
-have received guidance and training on the use of AI technologies in education.	0	3	10	33	19	5	70
-have raised concerns in relation to the use of AI in education.	1	8	23	20	11	7	70
Teachers, trainers, school leaders, academic staff, and other education personnel are actively:							
	Always	Often	Sometimes	Rarely	Never	N*	All
-using Artificial Intelligence technologies with their students.	0	3	11	35	15	6	70
-have received guidance and training on the use of AI technologies in education.	0	3	11	27	24	5	70
-have raised concerns in relation to the use of AI in education.	2	9	21	23	11	4	70

Source: E-speed project survey 2020. Multiple choices were possible. * no response.

6. Digital skills of teachers, trainers, school leaders, academic staff, and other education personnel

KEY FINDINGS

- The level of understanding of the concept of digital skills is very high.
- Uneven support structures and processes are in place to support the development of digital skills.
- The training needs of education personnel on digitalisation in education are by large not met so far.
- The extent to which training needs are met show a significant socio-economic divide at the expense of rural and poorer areas.
- Relatively low levels of confidence of education personnel in using digital technologies in their daily work, especially amongst experienced personnel, those working in rural and poorer areas
- The development of digital skills are partially covered in specific support measures for education personnel.

A major spotlight in the project research was put on the level of digital skills of education personnel.

6.1. The level of digital skills of educators

To start with, the online survey findings show that the level of **understanding of the concept of digital skills is considered to be very high** (see Table 13), both amongst ETUCE and EFEE members. Over 90% of survey respondents considered that their organisation has a good understanding of the digital skills. Similarly, around 90% reported that education personnel themselves have a good understanding of the concept of digital skills.

However, **this overall good understanding of the concept of digital skills does not always translate into practice**. Only half of the respondents considered that education personnel are in practice well equipped with digital skills themselves¹⁸ This view was similarly shared by EFEE and ETUCE members.

Table 13: Views of ETUCE and EFEE members on the digital skills of education personnel

		Fully agree	Somewhat agree	% of fully and some agree	Somewhat disagree	Fully disagree	N	Total
UNDERSTANDING DIGITAL SKILLS								
Our organisation has a good understanding of what digital skills are	Both	37	27	91%	4	0	2	70
	EFEE	12	8	100%				20
	ETUCE	25	19	88%	4		2	50
Teachers, trainers, school leaders, academic staff, and other education personnel and other education personnel are well equipped with digital skills themselves	Both	3	33	51%	29	2	3	70
	EFEE	2	8	50%	9		1	20
	ETUCE	1	25	52%	20	2	2	50
Teachers, trainers, school leaders, academic staff, and other education personnel in our sector(s) have a good understanding of what digital skills are	Both	15	47	89%	6	0	2	70
	EFEE	7	12	95%	1			20
	ETUCE	8	35	86%	5		2	50

Source: E-speed project survey 2020. * no response.

The case study findings showcased how important it is to have the educators equipped with the appropriate level of digital skills and empowered to put them to use as they see this fit, as this ensures success of using digitalisation in education. In the Danish case study context, stakeholders interviewed were unanimous that teachers are treated as professionals, who are autonomous and thus can decide when and how to use digital tools in their teaching and assessment practice. This is considered to be a key to the success of digitalisation in education, a perspective shared amongst all stakeholders interviewed. Teachers need to be empowered to decide on how to use digital tools when and where they see fit (and also not to use the digital tools just for its own sake), a view that was also welcomed by the interviewed students. This professional freedom to decide when and how to use digital tools is necessary because the use of digital tools is often subject-specific and needs to reflect the needs of each specific context. Examples given by the Danish interviewees related to the [different uses of digital tools in humanities or hard science subjects](#).

¹⁸ This echoes other studies. A 2018 Organisation for Economic Co-operation and Development (OECD) study, based on TALIS results, found that on average less than 40% of educators across the EU felt ready to use digital technologies in teaching, with divergences between EU Member States, see [OECD iLibrary | TALIS 2018 Results \(Volume I\): Teachers and School Leaders as Lifelong Learners \(oecd-ilibrary.org\)](#)

Survey respondents report that the majority of **education personnel are ready to use the digital tools**, supporting earlier findings from the survey (see section 5.1). Views on this are predominantly positive (see Table 14). The majority of respondents partially or fully agreed that that education personnel have both easy access to digital tools in order to design and implement digital teaching and have sufficient digital competences to use for teaching, learning and assessment.

A more **significant gap appears in relation to professional training**. The majority of respondents considered that education personnel have not received effective and quality professional training on digital pedagogy, including quality professional training on how to use internet and communication tools for online or blended teaching¹⁹. This raises the question of ensuring effective and quality professional training of educators with respect to the use of digital tools.

Table 14: ETUCE and EFFE member views on the educational personnel readiness to use digital tools

Teachers, trainers, school leaders, academic staff, and other education personnel have:	Fully agree	Somewhat agree	% of fully and some agree	Somewhat disagree	Fully disagree	N*	All
- easy access to digital tools in order to design and implement digital teaching (technical devices and broadband)	12	39	73%	13	5	1	70
-sufficient digital competences to use for teaching, learning and assessment	2	44	66%	20	3	1	70
-received effective and quality professional training on digital pedagogy, including quality professional training on how to use internet and communication tools for online or blended teaching	6	20	37%	32	11	1	70

Source: E-speed project survey 2020. * no response.

The survey findings also show **relatively low levels of confidence of education personnel in using digital technologies in their daily work** (which is also a key element of competence, see Table 15). Across the groups considered, the majority of education personnel are only somewhat confident in using such technologies. Only a third of respondents have indicated that education personnel are confident in the use of digital tools. A minority of education personnel (around 20-30%) are reported as being very confident in the use of digital technologies. On a positive note, only a small proportion of education personnel are reported to be not confident at all.

In relation to levels of confidence it was differentiated between new and experienced personnel. The **levels of confidence are reported to be greater for new personnel**, especially by ETUCE members. In contrast, only 20% of experienced personnel are reported to be very confident with the use.

19 This aligns with other data such as ICILS and European Digital Education Action Plan.

Looking at the **rural / urban divide, the gap is more than double at the expense of rural areas**. Whereas in urban areas the very confident use is reported by 26% of respondents, this declines to 6% in rural areas. ETUCE members are significantly more positive in this respect compared to EFEE members.

The gap is similar **considering the wealth inequalities and the distinction between richer and poorer areas**. Whereas in richer areas the high confidence levels are reported by 27% respondents, this declines to 6% in rural areas. ETUCE members are significantly more positive in this respect compared to EFEE members.

In other words, **personnel with high levels of confidence tend to be new entrants to the profession, living in urban and richer areas**. This could be due to a complex interaction of factors, such as new entrants benefitting more from the quality initial teacher training, also capturing digital education issues (which is fairly new in many countries). Personnel working in urban and richer areas also tend to benefit from better digital infrastructure and higher accessibility to better quality professional training on digital education issues.²⁰

Table 15: To what extent do education personnel feel confident using digital technologies in their daily work?

		Not confident at all	Somewhat confident	% of all	Very confident	% of all	N	All
Novel (new entrants)	Both	4	39	56%	24	34%	3	70
	EFEE	2	13	65%	5	25%		20
	ETUCE	2	26	52%	19	38%	3	50
Experienced	Both	6	47	67%	14	20%	3	70
	EFEE	1	16	80%	3	15%		20
	ETUCE	5	31	62%	11	22%	3	50
In urban areas	Both	4	44	63%	18	26%	4	70
	EFEE	1	17	85%	2	10%		20
	ETUCE	3	27	54%	16	32%	4	50
In rural areas	Both	10	53	76%	4	6%	3	70
	EFEE	2	18	90%		0%		20
	ETUCE	8	35	70%	4	8%	3	50
In the richer areas	Both	2	45	64%	19	27%	4	70
	EFEE		17	85%	3	15%		20
	ETUCE	2	28	56%	16	32%	4	50
In the poorer areas	Both	15	48	69%	4	6%	3	70
	EFEE	1	19	95%		0%		20
	ETUCE	14	29	58%	4	8%	3	50

Source: E-speed project survey 2020. Multiple choices were possible. * no response.

20 See also Kormos, Erik M. "The unseen digital divide: Urban, suburban, and rural teacher use and perceptions of web-based classroom technologies." Computers in the Schools 35.1 (2018): 19-31.

In this context, the findings from the case study visits in Denmark and Romania illustrate good practice examples of how educators become confident in the use of digital tools over time, in a supportive and pedagogy-driven way (see Box 2).

Box 2: High level of confidence of educators using digital tools: reflections from case study visits in Denmark and Romania

In Denmark, the majority of teachers in the school visited have adopted digital tools for pedagogical purposes on a voluntary basis, including using programmes which comply with data protection rules and can support different elements in teaching and learning. There has been a focus on upskilling teachers' digital skills which has been achieved. The voluntary use of digital tools is most important, with teachers deciding when and where to use them.

"The use of digital tools differs more by subject, for example, the teaching of languages, history, social sciences uses more digital tools, whereas in maths and science this is less the case or in different ways."

Most of teachers are confident in using digital tools in their teaching, also because they are deciding when to use these tools, and they can develop and use these tools in their own context and pace. The support provided to teachers is also important to ensure confidence amongst the teachers. However, some teachers are not confident to the same extent in the use of digital tools as their confidence in their subject knowledge, and this need has been addressed through additional training, support from peer colleagues and IT digital experts and a gradual adoption of digital tools. Teachers are also trained in the use of specific digital tools, and it has helped that this training is delivered by their colleagues, and is augmented by the availability of additional support on a daily basis.

The use of digital tools has also transformed the assessment practices so that assessment practices are now more nuanced through the use of digital tools. Some of the rules on data protection can also have a negative impact on school assessment practices, for example not being able to see previous student assessments. Furthermore, such data protection rules can make the planning of teaching with digital tools more cumbersome, because teachers have to take these into account.

There is also a tool called DIGIT developed by the Centre of Educational Means which helps the teachers in primary and lower secondary education to decide which digital tools to use and assess themselves how well they use digital tools in teaching.

6.2. The support available to develop digital skills

While teachers indicated they are ready to use digital technologies in their teaching, the majority indicated that they are not sufficiently confident and competent to use these tools in their teaching.²¹ This appears to be aligned with the uneven availability of support structures and processes. Overall, such supports are reported by less than half of the survey respondents, and ETUCE members are significantly more negative in this respect compared to EFEE members.

Probing further, the most frequent type of support provided to develop digital skills is a dedicated programme/training for digital skills in the country/region/school. This was reported by around 50%, and much higher amongst EFEE members. Another very common approach was the provision of training support by the education authorities to fully support teachers, trainers, school leaders, academic staff, and other education personnel in developing their digital skills. Again, EFEE member views were much more positive in this regard.

The survey also asked respondents to consider **the extent to which digital skills are covered in specific support measures for education personnel** (see Table 16). The broad answer across the responses is that such coverage is **only partial**. On average, around 10% of respondents considered that digital skills are very well covered in the specific support measures. The majority view is that **digital skills are “somewhat covered”**. This indicates that the design of digital education supports needs to be revisited.

On the positive side, **around 50-60% respondents consider that digital skills are at least partially covered in the personnel standard frameworks, initial training and continuous professional development**. Here, EFEE members consistently have more positive views compared to ETUCE members.

The respondents were less positive **when examining other support aspects, such as adequate funding, technical infrastructure and pedagogical support to develop digital skills and embed digital education**. This points to the issue of holistic investment in digitalisation in education. Indeed, over half of the respondents considered that funding needs for the development of digital skills are not at all or insufficiently met. This concern was especially high amongst the ETUCE members. Similarly, around half of respondents reported that the needs for pedagogical support to embed digital education are not at all or insufficiently met. Similar views emerged amongst EFEE and ETUCE members.

Finally, 46% of respondents considered that the needs for the technical infrastructure to embed digital education is not at all or insufficiently met. Similar views emerged amongst EFEE and ETUCE members.

21 This echoes other studies, see European Commission (2019). Digital Education at School in Europe. Eurydice Report. Luxembourg: Publications Office of the European Union.

Table 16: How well are digital skills included in specific support measures?

		% not at all and insufficiently met	% somewhat covered	% very well covered	Total
Teachers, trainers, school leaders, academic staff, and other education personnel standard frameworks	Both	34%	56%	4%	94%
	EFEE	10%	80%	10%	100%
	ETUCE	44%	46%	2%	92%
Initial training of teachers, trainers, school leaders, academic staff, and other education personnel	Both	39%	50%	6%	94%
	EFEE	20%	65%	15%	100%
	ETUCE	46%	44%	2%	92%
Continuous professional development	Both	39%	46%	9%	93%
	EFEE	25%	55%	20%	100%
	ETUCE	44%	42%	4%	90%
Providing adequate funding for development of digital skills	Both	53%	31%	9%	93%
	EFEE	35%	45%	20%	100%
	ETUCE	60%	26%	4%	90%
Providing the technical infrastructure to embed digital education	Both	46%	41%	6%	93%
	EFEE	40%	45%	10%	95%
	ETUCE	48%	40%	4%	92%
Providing enough pedagogical support to embed digital education	Both	54%	36%	3%	93%
	EFEE	50%	40%	5%	95%
	ETUCE	56%	34%	2%	92%

Source: E-speed project survey 2020. Multiple choices were possible. Totals do not always add up to 100% due to some respondents not answering this question.

Here, experiences from the case study visits to Denmark and Romania illustrate how critical is **the range of support** to the success of digitalisation in education is, pointing to the need for holistic support, including the adequate technological base, as well as support to skills development in the initial and continuing professional development, supported by strong leadership. This could be seen as a **“digital” eco-system** with a culture of collaboration and a holistic set of support to help teachers embed these tools into their practice.

In Denmark, digitalisation in education is accompanied by sufficient infrastructure and extensive ongoing support. In the institutions visited, the use of digital tools in the education process appears to be successful because it is underpinned by the availability of adequate levels of infrastructure installed and available at education institutions. The educational institutions benefit from a holistic support programme that is well funded and is provided throughout the school year. Such support includes the hardware and software as well as good-quality broadband connections available to teachers and students. Equally important is the availability of continuous technical support in the education institutions, so that teachers and students can turn to the IT specialists to resolve technical issues. The continuous professional development system is well developed, and teachers can access additional training courses on a regular basis should they wish so. Teachers furthermore need to undergo an annual training-needs assessment which is part of their performance review. As put by one interviewee,

"Some teachers received needed support from management, technical support staff and peer colleagues to learn how to use digital platforms, setting accounts, and adapt and create the online educational content."

Furthermore, the importance of peer and leadership support in developing digital skills was reported in the case study visit in Romania. Leadership is important in realising the potential benefits of digitalisation in education through embedding of digital tools across educational sectors, levels and subjects varies. The case study interviews revealed that the use of digital tools was higher where the senior leadership and management of educational institutions are committed to promoting digital education. For instance, it was reported that before the COVID-19 pandemic, some of the teachers and education personnel in the school and university case-study setting were reluctant to use digital tools, usually due to a preference for traditional education methods or because they lacked the necessary digital competences.

A challenge that existed before and during the first months of the COVID-19 pandemic was that there were a number of teachers and education personnel in both institutions who avoided using digital education tools. After consulting with the school leaders and teaching staff of the institutions, they found out that there were several reasons for such avoidance, including anxiety, stress and an inability to cope during the pandemic; a preference for traditional face-to-face teaching; as well as a lack of necessary digital competences or digital equipment. Additional support, encouragement and training were provided to such teachers and education personnel by a range of stakeholders - the management, the IT personnel, and more digitally advanced peer teachers. Arising out of these supports, those teachers and education personnel learned how to use digital education tools and managed to readjust to online teaching within a few months.

This experience showcases a broader trend in both educational institutions in relation to a culture of collaboration between teachers and education personnel around the use of digital tools. These supports included both, technical support received from existing IT support functions, as well as the exchange of professional practice with peers about the use of digital tools in the daily pedagogical practice of teaching. This peer support and reflection in relation to their digital educational practices is considered to be extremely valuable by the stakeholders interviewed. Such practices allows staff to resolve technical issues associated with using digital tools in their teaching practice, while also enabling them to reflect on the best and optimal use of digital tools, so they can enhance their practices from a pedagogical perspective. In words of interviewees,

"Teachers who had no digital devices were given the computers from the IT lab. Those who were less digitally skilled used tutorials provided by our IT person and help from their co-workers and students. Eventually, they learned how to work with different digital platforms and started teaching online."

"Digital tools were invented to help us, but if we don't know how to use them, they are useless."

6.3. Digital skills and initial teacher training and continuing professional development

In contrast, **digital skills are less integrated in initial training and continuing professional development** of education personnel. In the online survey, this was reported in around 40% of cases, with slightly more positive views from EFEE members (see Table 17). Specifically, 37% respondents reported that teachers, trainers, school leaders, academic staff, and other education personnel receive quality digital training during their initial teacher education. The digital training seems to be more widespread in continuous professional development, which was reported by 43% respondents.

Table 17: Views on the support available to develop digital skills of education personnel

		Fully agree	Somewhat agree	% of fully and some agree	Somewhat disagree	Fully disagree	N	Total
SUPPORT TO DEVELOPING DIGITAL SKILLS								
There is a dedicated programme /training for digital skills in our country/region/school	Both	15	21	51%	25	6	3	70
	EFEE	7	5	60%	7	1		20
	ETUCE	8	16	48%	18	5	3	50
Teachers, trainers, school leaders, academic staff, and other education personnel receive quality digital training during initial teacher education	Both	4	22	37%	32	9	3	70
	EFEE	2	9	55%	7	1	1	20
	ETUCE	2	13	30%	25	8	2	50
Teachers, trainers, school leaders, academic staff, and other education personnel receive quality continuous digital training	Both	2	28	43%	26	12	2	70
	EFEE	1	10	55%	9			20
	ETUCE	1	18	38%	17	12	2	50
Teachers, trainers, school leaders, academic staff, and other education personnel are well supported throughout their careers to improve their digital skills	Both	4	17	30%	35	11	3	70
	EFEE	3	10	65%	7			20
	ETUCE	1	7	16%	28	11	3	50
Education authorities fully support teachers, trainers, school leaders, academic staff, and other education personnel in developing their digital skills	Both	2	30	46%	28	6	4	70
	EFEE		14	70%	5		1	20
	ETUCE	2	16	36%	23	6	3	50

Source: E-speed project survey 2020. Multiple choices were possible. * no response.

The Danish higher education case study showcases what **good practice can look like in the case of an initial teacher training programme in Denmark**.

The teacher training institution visited in the case study is a collaboration of five universities in Denmark that provides teacher training. The teacher training programme offers a mix of practical and theoretical pedagogical training to the initial teacher educators, referred to below as the candidates. Every four years, the Ministry of Education issues a tender for the provision of teacher training services and the consortium of five universities has been successfully bidding for it in the last years. Around 400 candidates are trained each year, by around 80 trainers and vocational consultants. The curriculum is provided by the Ministry of Education, and the training is funded with around EUR 15 million per year. In 2017, the curriculum was reformed, and one of the specific requirements from the Ministry was to include and integrate digital education across the curriculum. The training itself is blended in terms of where learning takes place, with a blend of physical presence and a virtual learning platform for teacher candidates. In the COVID-19 context, all candidate training has been moved fully to online modules and there has been no in person teaching.

In the case of Denmark, in contrast to other countries, digital education is an integral part of the teacher training programme, with the topic of digital tools forming an integral part of each teacher training module. The candidates use and discuss the technologies in their teaching practice, and they reflect on their digital teaching practices through an action learning process.

Throughout their teacher training, a virtual platform is used that provides access to materials, notes and discussion forums across teams and disciplines. In addition, digital media are included in the training with the aim of supporting the candidates' knowledge and experience of using digital media in their own practice for planning, teaching and evaluation, and the knowledge of teaching materials in the subject, including digital teaching materials. The use of digital media is an integral part of the course of study, among other things through virtual courses, where the candidates address the relationship between the digitalisation and learning and the opportunities that this opens up in teaching. The training also enables the candidates to examine what happens to teacher and student roles in virtual teaching as a digital practice. Throughout their training, candidates are expected to develop a range of skills and competences relating to the digital education. These are as follows:

- have knowledge of the subject's materials and technologies, including digital resources;
- be able to develop his or her own teaching practice through reasoned academic didactic choices, including being able to use and think about digital practices;
- be able to relate to different forms of work and teaching, including digitally supported forms, and incorporate them into his / her own teaching;
- be able to think and discuss digitally supported forms of evaluation and feedback;
- have knowledge of virtual teaching as a digital practice, including blended and flipped learning;
- relate to current discussions about teaching, learning and education in relation to digital and global challenges.

Autumn				
August	September-December	October	September-December	December
Being a teacher	Being a teacher in subject A	Being a teacher in practice 1	Being a teacher in subject B	Being a teacher in practice 2
3 days	3 days	1 day	3 days	1 day
Regional	National	Local	National	Local
Spring				
January-February	March	March-April	April-May	May-June
Being a teacher in upper secondary education	Being a teacher in practice 3	Being a teacher in practice	Being a teacher in society	Examination
3 days	1 day	½ day	3 days	Handing in assignment
National	Local	Virtual	1 day virtually	
			2 days regionally	

In addition, an online action learning activity is undertaken by the teacher candidates, following the outline below.

Time	Module	Activity
August	LEARN	Introduction to Teams, action learning (clarification of purpose and written templates), setting-up action learning groups etc.
		EVERYONE performs an action formalized in writing.
October	LIP1	Intro to didactic conversations based on Beck, pp. 54-56. Physical didactic conversations about the actions.
		All groups: One person performs an action. Virtual didactic conversation about the action with notes. A select group performs and records a virtual didactic conversation about an action - teacher is present (and offering guidance, if necessary).
December	LIP2	Collective analysis of recorded didactic conversation with a view to upgrading actions and conversations. Focus on use of theory, the action, empirical analysis and the didactic conversation. Initiate new action.
		All groups: One person performs an action. Virtual didactic conversation about the action with notes.
March	LIP3	New groups are set up with a view to action in relation to the Theo-Post-Grad assignment.
Conversation about new action in the groups.		EVERYONE performs an action oriented towards the Theo-Post-Grad assignment.
April	LIS	Collation of the actions performed - loosely structured didactic conversations and mutual sparring.

6.4. The main training needs of education personnel

In contrast to the case study findings above, the online survey findings show that the **training needs of education personnel on digitalisation in education are by large not met so far** (see Table 18). The needs of educational personnel differ for different groups of educators and the gaps in competence appear to show a significant socio-economic divide.

The first distinction drawn is **between new and experienced personnel**. Here, for both groups only **around 40% respondents** considered that their training needs for digital education are met. This indicates that for the majority of education personnel their training needs are not met. **The gap in meeting training needs appears to be even greater depending on the socio-economic characteristics of areas where education personnel work in.**

Looking at the **rural / urban divide, the gap is more than double at the expense of rural areas**. Whereas in urban areas the training needs are considered to be met by 49% respondents, this declines to 20% in rural areas. ETUCE members are significantly more negative in this respect compared to EFEE members.

The gap increases **three-fold when considering wealth inequalities and the distinction between richer and poorer areas**. Whereas in richer areas the training needs are considered to be met by 57% of respondents, this declines to 19% in rural areas. ETUCE members are significantly more negative in this respect compared to EFEE members.

Put differently, **training needs are most frequently met for education personnel when they live in richer areas**, suggesting a pattern in areas that are connected to high quality physical and digital infrastructure, such as in towns and cities.

Table 18: Are teachers', trainers' and other education personnel's training needs on digitalisation in education met?

For the following categories:		Mostly met	Met	% of mostly + met	Insufficiently met	Not met at all	N*	All
Novel	Both	21	7	40%	35	4	3	70
	EFEE	10	2	60%	7	1		20
	ETUCE	11	5	32%	28	3	3	50
Experienced	Both	23	7	43%	31	6	3	70
	EFEE	9	2	55%	8	1		20
	ETUCE	14	5	38%	23	5	3	50
In urban areas	Both	26	8	49%	29	4	3	70
	EFEE	9	3	60%	7	1		20
	ETUCE	17	5	44%	22	3	3	50
In rural areas	Both	12	2	20%	43	9	4	70
	EFEE	5	1	30%	13	1		20
	ETUCE	7	1	16%	30	8	4	50

For the following categories:		Mostly met	Met	% of mostly + met	Insufficiently met	Not met at all	N*	All
In the richer areas	Both	30	10	57%	26	1	3	70
	EFEE	10	3	65%	7			20
	ETUCE	20	7	54%	19	1	3	50
In the poorer areas	Both	12	3	21%	41	12	2	70
	EFEE	6	1	35%	11	2		20
	ETUCE	6	2	16%	30	10	2	50

Source: E-speed project survey 2020. Multiple choices were possible. * no response.

7. Existing social dialogue measures to address the challenges and opportunities of digitalisation in education

KEY FINDINGS

- The full potential of social dialogue is not exploited in addressing the digitalisation in education.
- The most frequent type of social dialogue was information sharing and communication, followed by consultation; collective bargaining on digital education issues was limited.
- Trade unions and employer organisations tend to work on digital education issues alone or with other organisations / confederations - rather than with their social partner.
- The level of joint activity is lower, compared to the level of measures taken by organisations on their own.
- Working alone and working jointly, the types of activities are very similar. The most frequent type of action is developing policy / guidance / documentation, followed by establishing support /advice/ mentoring structures to the members of organisations.
- A number of important successful measures have been identified, including structural and policy level changes, training and empowering staff and raising the overall awareness of digitalisation challenges and opportunities.
- A number of countries also reported successes in addressing the issues of digitalisation through collective bargaining agreements.

The project research activities showed that the issues related to the digitalisation in education are not fully addressed in the current social dialogue structures.

7.1. The digitalisation in education and social dialogue

In the online survey, ETUCE and EFEE members provided their views on the measures currently in place to address the digitalisation in education, arising from the involvement in the social dialogue and by member organisations themselves.

The first aspect considered was the use of social dialogue between trade unions and employer organisations to address the challenges and opportunities of digital education (see Table 19). To start with, 10 or 14% of respondents indicated that no forms of social dialogue takes place and this was reported by two EFEE and 10 ETUCE members (in seven countries).

Where social dialogue is taking place, it is typically in the format of **information sharing and communication**, reported by nearly 70% of respondents. In this respect, EFEE members were much more positive about such activities taking place compared to ETUCE members.

The second most frequent type of social dialogue activity was **consultation between social partners**, reported by around 60% of respondents. There was parity in relation to this view among between EFEE and ETUCE members.

In contrast, the **more intense forms of social dialogue - such as collective bargaining and joint projects - took place less frequently**. They were reported by around a third of respondents. Importantly, EFEE members were twice as likely to report such forms compared to ETUCE members.

Table 19: Are the challenges and opportunities offered by digital education policy and reforms addressed in your country through the different forms of social dialogue?

	Both		EFEE		ETUCE	
	Number	%	Number	%	Number	%
Information sharing/communication	46	66%	17	85%	29	58%
Consultation	41	59%	13	65%	28	56%
Joint working/projects with employers	24	34%	11	55%	13	26%
Negotiation/collective bargaining	24	34%	11	55%	13	26%
Total	70	100%	20	100%	50	100%

Source: E-speed project survey 2020. Multiple choices were possible.

These findings are further supported when probing about specific forms of social dialogue (see Table 20). **The most binding form of social dialogue - collective bargaining - was reported to include digital education issues by around 30% of respondents**. This was similar for EFEE and ETUCE members. Other forms of social dialogue are taking place in around half of organisations, including joint working/projects with employers, information sharing/communication and consultation.

Trade unions and employer organisations also work on digital education issues alone or with other organisations / confederations. Typically trade unions work alone on digital education issues (reported by 48% of ETUCE members) and employer organisations also work alone (reported by 60% of EFEE members). Similarly, activities with other trade unions / confederations were reported by 52% of ETUCE members and activities with other employer organisations by 45% of EFEE members.

An interesting perspective is revealed considering the top social dialogue activities among EFEE and ETUCE members. Most EFEE members indicated that they, as employer organisations, are often working alone on this topic. For ETUCE members, the top activities were trade unions working with other trade unions and trade unions working alone.

Table 20: Considering specific social dialogue activities on digital education in your country, which of the following take place?

	Both		EFEE		ETUCE	
	Number	%	Number	%	Number	%
SOCIAL DIALOGUE						
Education trade unions and employers act together through other forms of social dialogue (e.g. Joint working/projects with employers, information sharing/communication, consultation)	33	47%	11	55%	22	44%
Education trade union and employers' organisations negotiate digital education issues through collective bargaining	20	29%	6	30%	14	28%
ORGANISATIONS WORK ALONE						
Education trade unions tend to work alone (e.g. through research, lobbying, campaigning, awareness raising etc.)	30	43%	6	30%	24	48%
Education trade unions work with other trade union federations and/or trade union confederations	32	46%	6	30%	26	52%
Education employer organisations tend to work alone (e.g. through research, lobbying, campaigning, awareness raising etc.)	22	31%	12	60%	10	20%
Education employers' organisations with other employer organisations/ministries/ employer organisations confederations	23	33%	9	45%	14	28%
Total	70	100%	20	100%	50	100%

Source: E-speed project survey 2020. Multiple choices were possible.

Furthermore, respondents reported on **actions on a range of digital education topics, both taken by their own organisation and jointly with their social partners.**

To start with, respondents identified actions taken by own organisation (see Table 21). **Encouragingly, 90% of organisations were proactive in relation to digital education.** The most frequent type of action taken pertained to developing policy / guidance / documentation (on average by 40% of respondents, similarly for EFEE and ETUCE members). This is followed by establishing support /advice/ mentoring structures to the members of organisation and providing training. This pattern is consistent across the variety of digital education topics and EFEE/ETUCE membership.

Fewer respondents reported that their organisation carried out research and established a dedicated structure or body to deal with specific digital education bodies. Again, this pattern is consistent across the variety of digital education topics and EFEE/ETUCE membership. Interestingly, survey respondents indicated a fairly similar level of activity across the specific digital education topics.

Table 21: What action has your organisation taken in relation to the following topics?

		Developed policy, guidance, documentation to your members	Established support, advice, mentoring structures to your members	Provided training to your members	Carried out research	Established a dedicated structure/body	No action taken
The use of digital technologies in education	Both	33	33	31	22	11	12
	EFEE	11	14	13	8	5	2
	ETUCE	22	19	18	14	6	10
The future of work in education	Both	31	39	30	24	13	8
	EFEE	9	17	11	8	6	1
	ETUCE	21	22	19	16	7	7
The collection and use of data on learners and staff	Both	30	22	20	15	7	18
	EFEE	10	9	7	4	4	6
	ETUCE	20	13	13	11	3	12
Addressing health and safety concerns from digital education	Both	29	25	21	15	12	15
	EFEE	11	9	8	3	6	4
	ETUCE	18	16	13	12	6	11

Source: E-speed project survey 2020. Multiple choices were possible.

These findings are to some extent further supported when describing measures on specific digital education topics taken jointly together with the social partner (see Table 22). However, **the level of joint activity is lower, compared to the level of measures taken by own organisation alone.** On average, 80 measures were taken by respondents' own organisation, declining to the average of around 40 for measures taken jointly with the social partner.

The lack of frequent attention to specific digital education issues is consistent across all topics. It is particularly low for issues such as the latest technical developments, addressing copyright and intellectual property in the education sector and addressing the impact of Artificial Intelligence in education.

The most frequent joint action activity is in relation to developing policy / guidance / documentation (on average by 30% of respondents, similarly for EFEE and ETUCE members). This is followed by jointly establishing support /advice/ mentoring structures to the members of organisations and providing joint training. This pattern is consistent across the variety of digital education topics and EFEE/ETUCE membership.

In contrast, fewer respondents indicated that joint action was carried out in terms of research and establishing a dedicated structure or body to deal with specific digital education bodies. Again, this pattern is consistent across the variety of digital education topics and EFEE/ETUCE membership.

Table 22: What action has your organisation taken jointly with its social partner counterpart in relation to the following topics?

		Developed policy, guidance, documentation to your members	Established support, advice, mentoring structures to your members	Provided training to your members	Carried out research	Established a dedicated structure/body	No action taken
The use of digital technologies in education	Both	22	22	14	7	6	31
	EFEE	9	12	6	0	3	6
	ETUCE	13	10	8	7	3	25
The future of work in education	Both	22	21	15	9	10	27
	EFEE	8	10	5	1	3	6
	ETUCE	14	11	10	8	7	21
The collection and use of data on learners and staff	Both	18	17	10	8	9	30
	EFEE	6	6	3	2	5	8
	ETUCE	12	11	7	6	4	22
Addressing health and safety concerns from digital education	Both	19	20	10	7	10	30
	EFEE	6	7	4	1	4	9
	ETUCE	13	13	6	6	6	21
Addressing copyright and intellectual property in the education sector	Both	13	11	13	4	4	39
	EFEE	4	3	4	0	3	10
	ETUCE	9	8	9	4	1	29
Addressing the impact of Artificial Intelligence in education	Both	7	6	7	5	3	48
	EFEE	2	1	2	2	0	15
	ETUCE	5	5	5	3	3	33

Source: E-speed project survey 2020. Multiple choices were possible.

7.2 Successful measures addressing the digitalisation in education

A number of survey respondents also reported **a range of successes arising from these measures** (see Box 3). The following examples capture a range of activities that include structural and policy level changes, including the development of dedicated strategies, plans and dedicated structures supporting digitalisation. Notably, successes were reported in training and empowering staff and raising the overall awareness of digitalisation challenges and opportunities. A number of countries also reported successes in addressing the issues of digitalisation through collective bargaining agreements, including the right to disconnect in Italy (the right to be unavailable for contact outside the regular working hours) and the use of digital equipment and digital education tools, including questions of workers health, work-life-balance, working time and data protection in Germany.

Box 3: Key successes from measures addressing digitalisation in education

Structural and policy changes

Ireland: The Digital Strategy for Schools (2015-2020) ICT infrastructure fund provides grants worth €210m for ICT Infrastructure to schools over the five years of the Strategy. INTO continue to campaign for an increase in funding to primary schools to ensure that necessary resources can be accessed by teachers and pupils. In January 2020 the Minister announced a €40m funding package which would be distributed across eligible schools. During the sudden Covid-19 school closures, a €10 million fund was announced, which was secured by redirecting funding which had been planned for distribution to eligible schools following an application process towards the end of 2020. The grant was revised in light of the Covid-19 crisis to target and support disadvantaged students and to support new priorities in students' learning. Schools were asked to re-prioritise this funding where needed to support the continuity of teaching and learning for students in the context of the current public health crisis.

Netherlands: A Dutch Acceleration Plan is being implemented. This is a joint plan of universities and universities and applied sciences. More information on: <https://versnellingsplan.nl/english/>

Poland: Establishment of a Centre of Excellency in Teaching and Science (based largely on digital solutions) and a project of digitalisation of Polish universities (value EUR 100,000) named "Digital University" offered to the Ministry of Education and Science.

Slovenia: A national policy and strategy is being implemented. A policy paper on digital education is being finalised. A number of teachers of all levels and parents participated in various professional learning and

educational programmes offered by the Ministry and the Pedagogical Institute. Ministry staff is better qualified in the area of digital education. Safety and health instructions have been developed as policies to schools.

Training and empowerment of staff

- Members feel empowered to negotiate in workplaces on issues and situations they are uncomfortable with.
- The creation and funding for tutor-teachers (a model where a teacher from every school is trained and funded to work as a support for other teachers in the use of digital education).
- A number of trained pedagogical specialists.
- Professional development programme for staff.

Raising awareness of digitalisation issues

- There is greater awareness of these matters now and communication with members has been enhanced.
- Succeeded in raising awareness about copyright and privacy issues in the school community.
- Succeeded in raising awareness about safety and health issues in the workplaces.
- Our trade union has organized two cyberbullying conferences in the last 3 years. During these events, we shared our experiences and good practices in the fight against violence against teachers and young people in the digital world.

Improving social dialogue outcomes

- Better social dialogue
- Establishment of formal groups with social partners.

Italy: Established the right to disconnect for education workers in the last National collective agreement and increased awareness about the significant negative effects of work-related stress in the education sector.

Germany: Concluded some service and work agreements in some federal states and some regions as a result of negotiations between elected worker / employee-councils and education ministries/authorities concerning the use of digital equipment and digital education tools, including questions of workers health, work-life-balance, working time and data protection. Moreover: For the first time, the education authority is taking responsibility for equipping teachers with digital devices.

Furthermore, **nearly a half of survey respondents reported that the COVID-19 pandemic has brought forward new key actions on the digitalisation in education.** This relates to exponential growth of the use of digital technologies in education processes, a greater understanding of intellectual property issues and transparency over intellectual ownership, more training and professional development for personnel on digital issues, more funding to obtain digital devices and greater awareness of digitalisation in education. This has focused a spotlight on issues such as the lack of adequate computer equipment and the need for teachers to have their own devices, digital divide and exclusion and the problem of personal data protection.

Several respondents highlighted a range of measures their organisation had implemented to address the issues of digitalisation (see Box 4).

Box 4: Measures taken by ETUCE and EFEE members to address the digitalisation in education

Bulgaria: the Bulgarian Union of Teachers reported the following measures:

- Project "Qualification for professional development of pedagogical specialists" 2018-2021 including teachers' trainings digital competences. The project is funded by the Operational Program science and education for smart growth <https://teachers.mon.bg/Default.aspx>
- National Program "Qualification of pedagogical specialists" <https://www.mon.bg/bg/100822> <http://sbugb.info/sbugb.php?page=11&lang-bg&id=5536>

Germany: Trade Union GEW undertook a project "Education in the Digital World" to strengthen the union's voice and to raise awareness / activate its members. The main activities were conferences, research, public relations and publications. It was implemented by a national coordination-team (8 persons) and a national forum (ca. 50 persons). Resources were half a staff position and funding for meetings, conferences, publications and research. Further links: <https://www.gew.de/bildung-digital/> or <https://www.gew.de/bildung-digital/bundesforum>

Ireland: Irish National Teachers' Organisation (INTO) has undertaken extensive research. In recent years, the issue of digital technology has been a key consideration for those involved in education, given the ever-increasing role that it plays in our daily lives. Recognising the prevalence of digital technology in our society and therefore its critical importance within education, the INTO's Education Committee decided to explore the theme of ICT in the Classroom: Pedagogy, Policy and Practice at the 2017 Consultative Conference on Education. An in-depth study was conducted with a comprehensive discussion document published as part of this event (see link below), charting the plethora of developments in ICT policy and presenting a review of good practice happening in Irish primary schools. As part of this project, the INTO consulted with members through a survey which investigated "The Use of ICT in Schools". The results of this survey highlighted the positive practice already in place in schools but also served to underline the vacuum that exists with regard to funding, resourcing and support for schools as teachers endeavour to integrate ICT into teaching and learning. <https://www.into.ie/app/uploads/2019/11/ICT-in-Education.pdf>

Italy: as reported by trade union federation UILSCUOLA RUA, a recent collective agreement on distance learning activities has been signed by two of the five biggest unions, that mirrors the ministerial guidelines sent to schools before the agreement could be enforced. The agreement sets no measures to ensure health

and safety of those working from home, copyright acknowledgement, data privacy or reimbursement for connection expenses.

Norway: Union of Education Norway is in the final stages of establishing a comprehensive policy for the "digital shift" in a broad sense. In addition, it has been working (among other things) with the State directorate for education and training, on digital learning resources.

Portugal: FNE - Federação Nacional da Educação reported the following measures:

1. Training in the area of digital skills, through webinars;
2. Production of guiding documents in the area of digital work;
3. Campaigning action in view of the regulation of teleworking.

Romania:

The **trade union FNS ALMA MATER** has initiated several **parliamentary measures to support the financing of teachers and schools** for a smooth transition in the digital age.

The **trade union 'Free Trade Unions Federation in Education'** provided **trainings to improve digital skills of teachers**. According with our research 66.2% of teachers claim the need to be trained for online teaching. The main activities were to develop a training curriculum, obtain accreditation from MoE and implement 3 trainings at national level, on: digital skills (Teaching in online formats), online teaching methods for students with SEN and developing communication skills adapted to online teaching. For all those training we developed projects financed by Erasmus+; Norway Grants or partnership with private companies.

The main bodies involved in its implementation were the International and Projects Department and the Training and Education Department. The union conducted an internal consultation process concerning the training needs of affiliated members. The level of resources attached to it is approximately 500.000€. The main results of the measure were that 4532 teachers were certified as having the digital skills for online teaching and 789 teachers were certified for online teaching for SEN students.

The key challenges were to create a new e-learning platform adapted for new needs like creating lesson contents and addressing technical issues (trainees wish to participate in online training but have no digital skills). The union created a new IT team to supervise and provide guidance for trainees. The key lessons for developing similar measures in the future was being able to use all available financial resources (such as ESF, Erasmus+ etc) to implement a focus on projects and on skills development.

Further links: www.magicsens.eu; www.formare-fsli.ro; www.digitalnation.ro/profesor-online

8. The future of digitalisation in education

The project research activities also provided rich reflections on how digitalisation should be further addressed in education systems across Europe in the future.

Overall, it has emerged that **the digital dimension is becoming an integral part of the education system**, boosted by the move to emergency remote teaching during the COVID-19 pandemic. This means that educators in the near future and beyond may not necessarily return to a pre-COVID-19 situation, but instead there may be an increased use of digital tools also in face to face, online and blended learning environments. The core challenges will be to ensure that educators are well equipped with digital skills, are empowered to use digital tools as to support their pedagogical practice, and critically, that they reflect on the use of these digital tools within their education institutions. These conclusions are well illustrated in the findings from the two case study visits.

In Denmark, the state curriculum states that up to 20% of teaching time can be digital, and according to the case study stakeholders, this is where the delivery of educational activities is moving. In this way, digitalisation in education will become an integral part of the teaching and learning activities, supporting the education process. It is also expected that new specialised digital tools will become available and used by educators. This might include the teaching of programming for example. Also, digital education should provide opportunities to reflect critically on the use of digital media, so countries develop critical and reflective democratic citizens. The lessons learnt from the Danish educational institutions show clearly that digital tools can offer a level of flexibility in arranging and delivering teaching and assessment activities, which is a great advantage and illustrates that where digital tools are used appropriately, they can genuinely support learning and teaching processes.

Similarly in the **Romanian** educational institutions visited, they were of the view that for modern educational processes and institutions there is no longer a strong rationale for offering 'traditional educational' experiences that do not utilise digital technologies but instead only utilise books and pens. For this reason, there was a general agreement among the participants that in the future, educational processes and experiences will embed digital technology into face-to-face teaching, learning and assessment activities. In this way, digital tools will be further used by teachers and education personnel to deliver on the overall pedagogical mission of educational institutions. Participants recognised that there are pros and cons to both the more traditional teacher-centred practices and the more student-centred learning practices that can be best supported by digital technologies. They favoured the embedding of digital technologies into their existing practices and for teachers and educational personnel to use their professional judgement to decide which approaches are most appropriate, depending on their context.

The project activities further showed that European social partners in education need to support their national members in implementing the digitalisation agenda in the education systems. The online survey respondents outlined a range of recommendations that they believed will help the ETUCE and EFEE to better address the main challenges and opportunities of digitalisation in the education sector. It is worth mentioning that this question was answered by 50% of survey respondents. The respondents put forward a range of concrete actions for **the ETUCE and EFEE** to consider:

- Provide comparative information and a pan-European perspective on issues, such as the most effective new digital equipment, programs, methods and tools for digitalisation and providing regular information through country member organisations;
- Undertake research to compare the situation across Europe in the area of digital education, taking into account the voices of those working in the education systems;
- Provide a forum for discussion and exchange of experience, such as regular “state of the art” meetings to keep EFEE and ETUCE members informed;
- Identify and disseminate good practice across Europe addressing both challenges and opportunities;
- Prepare jointly developed guidelines and recommendations for addressing common challenges facing educational systems related to the introduction of digitalization in educational institutions;
- Develop action plans and joint action plans on how institutions should tackle digitalisation to help each organisation dealing with the topic;
- Lobby European institutions for increased funding and changes in the national education legislation and policy.

9. Conclusions

The project research activities, including the survey results and two case study visits to education institutions in Denmark and Romania, present a rich source of evidence about the challenges and opportunities of digitalisation in education.

Without a doubt, the **COVID-19 pandemic has supported a large shift** in the use of “digital” technologies in education, with the key question whether this shift is temporary or whether it will be sustained and built upon by educators. The impact of COVID-19 on digitalisation in education has been significant. All education systems resorted to some form or element of online education during the initial phases of the pandemic. This “going digital” was either full or partial depending on the circumstances in each country and institution. The majority of educators are planning to go back to pre-COVID 19 education models as soon as the pandemic situation allows this. This suggests a potentially missed opportunity to develop further the use of digital tools, exploiting advances and experiences from the pandemic.

The response to the pandemic was largely positive in most areas of the education system, although some cohorts of learners did not benefit. Educational institutions and educational staff and leaders have done well to cope with the move and illustrated a positive response to embrace change and allow education to continue. Also, the majority of the educational institutions were at least partially prepared to address the impacts of the pandemic, while in around a third of cases the education institutions were not prepared.

While there are many positive outcomes from the pandemic a number of challenges were also reported and these include different levels of maturity of institutions to move to online education, the lack of digital infrastructure, the lack of digital skills and working overload and pedagogical concerns. In addition, concerns were raised about the lack of reflection of local / regional circumstances, the lack of operational and practical guidelines and the lack of immediate funding available for online education. Ultimately, while Covid-19 has forced many educators to use digital technologies to continue teaching, many believe they are under resourced to continue such practices once COVID-19 passes. There is therefore a danger that the experience of digitalisation in the context of the COVID-19 pandemic will be a missed opportunity. Furthermore, there is a question about which digital education practices will be retained by educational institutions and which ones will be discontinued.

Looking outside the immediate impact of COVID-19, the online survey results showed an agreement amongst the ETUCE and EFEE national members on the **key challenges** for digitalisation in education. They were mainly seen as relating to the negative social impacts and costs of digitalisation, the intensification of workload and a range of health and safety challenges. Worryingly, there was **less agreement on the main opportunities** for digital education which included:

- Good opportunities for individual learning and empowering learners to engage in self-directed learning,
- Increasing access and making educational opportunities more inclusive,
- Making learning experiences more attractive to learners at risk of leaving school early,

- Few saw saving administrative costs as a main benefit from using digital tools.

At the education **policy level**, digitalisation is a very important policy priority, accompanied also by funding allocations and development of pedagogical guidance. However, the survey found that education practitioners seem to have a minor say in the formation of digital educational policy.

The use of digital technologies across education systems is widespread but it differs across the education settings. There appears to be limited use of digital tools in face-to-face education as they are partially used in such teaching, learning and assessment practices. This should be a cause of concern for both EFEE and ETUCE membership because it seems to contradict other aspects of the project findings. In particular, the case studies demonstrated a rich, critical and pervasive use of digital tools by mature education institutions. However, the responses to the survey and the case studies were dominated by the emergency remote teaching experiences of using digital technologies in education during COVID-19.

Overall, it appears that education personnel are more ready to use the digital tools. However, **a significant gap appears in relation to professional training** as education personnel have not received effective and quality professional training on digital pedagogy. In particular there appears to be a significant gap in relation to the provision of quality professional training on using internet and communication tools for online and/or blended teaching. The experiences of those who participated in the case studies show that the digitalisation agenda should be embedded as an integral part of quality initial and continuing teacher training, and not treated as a separate “technical” issue.

Another important aspect pertains to who develops and provides digital tools and devices for online / blended teaching and learning to the education sector. **Private companies play a pivotal role**, with limited involvement of education system stakeholders, in developing and offering such technologies. Looking to the future, the private sector will continue to have a major role in developing digital tools for the educational sector. At the same time, the project findings highlighted a concern over the key role many private companies play in this space. This has raised questions around how to curb their influence over the digitalisation of education, through a critical and reflective use of digital tools, which is a very important issue across Europe.

There was widespread agreement from all respondents in relation to **the types of investment required** to ensure the optimal development of digital education. This includes investment in the skills and competences of educational personnel, digital infrastructure, tools for students and education personnel. Respondents were more focused on the technologies currently being widely used in education rather than on newly emerging technologies, such as the use of artificial intelligence in education, which was reported by a minority in the survey. The use of such emerging technologies is also not reflected in the training contents of existing professional development programmes nor in the development of policy / guidance / documentation for educators. Most educators are more focused on what they are currently using and less focused, as yet, on newly emerging and future technologies.

In relation to the **digital skills of educational personnel**, the self-reported level of understanding of the concept of digital skills appears to be very high. However, this does not appear to translate into practice: not all education personnel are in practice well equipped with digital skills, and this is an issue that needs to be further explored. This should not be seen as surprising when triangulated with the findings of **uneven support**

structures and processes available in place to support the development of digital skills. The development of educational personnel digital skills, during initial and ongoing educational contexts, is not satisfactory. There is clearly a need to ensure educators, during all stages of their career, have access to quality digital educational programmes that equip them with the confidence and competence to use them effectively with their learners. This appears to link to the issue of quality and digital awareness of continuous professional development and the need for quality support to the educators in developing and updating their digital skills.

In practice, **the training needs** of educational personnel in relation to all areas of digitalisation in education are **by and large not met so far**. Also, the extent to which training needs are met shows a significant socio-economic divide where educators living and working in rural and poorer areas appear to be at a disadvantage. This finding is particularly alarming and suggests the need for further investigation and action on this issue, as they relate to the core educator digital competences.

Furthermore, the survey shows relatively **low levels of confidence among educational personnel in using digital technologies** in their daily work, especially amongst experienced personnel, those working in rural and poorer areas.

Ultimately, educational systems have successfully mastered the move to emergency remote teaching during the COVID-19 pandemic. However, the education personnel need much greater support to adequately embed digital technologies and associated pedagogies into their classroom practices. This will become a core priority for EFEE and ETUCE national members in the immediate and longer term, as digitalisation in education is likely to become an integral part of all aspects of educational activities; including teaching and learning, supporting the education process to a greater extent than before. We expect that in the future educational processes and experiences will combine online and face-to-face teaching, learning and assessment activities in the future and move towards more blended learning models of education. We anticipate that digital tools will be further used by teachers and education personnel to deliver on the overall pedagogical mission of educational institutions.

EFEE and ETUCE members have taken **a range of successful measures** to address digitalisation in education. However, from the perspective of social dialogue, the full potential of digital education has not yet been exploited. To date the most frequent type of social dialogue has been information sharing and communication, followed by consultation, whereas collective bargaining on digital education issues was limited. Trade unions and employer organisations tend to work on digital education issues alone or with other organisations / confederations - rather than in collaboration with other social partners. Indeed, the level of collaborative activity is less, compared to the initiatives taken by the organisations on their own.

Yet whether working alone or working together, the types of activities the EFEE and ETUCE members engage in are very similar. Several important successful measures have been identified, such as instigating structural and policy level changes, offering digital training and empowering staff and raising the overall awareness of digitalisation challenges and opportunities. A few countries also reported successes in addressing the issues of digitalisation through collective bargaining agreements.

A range of suggestions for concrete actions were put forward in the survey for EFEE and ETUCE, and these included the provision of information and observation, good practices, exchange and discussion platforms, as well as drafting guidelines, recommendations and action plans to help national members to deal with digital education issues.

Key references

Digital Education Action Plan 2021-2027 [Digital Education Action Plan \(2021-2027\) | Education and Training \(europa.eu\)](#)

[Digital Competence Framework for Educators \(DigCompEdu\) | EU Science Hub \(europa.eu\)](#)

European Commission/EACEA/Eurydice, 2018. Teaching Careers in Europe: Access, Progression and Support. Eurydice Report. Luxembourg: Publications Office of the European Union

European Commission/EACEA/Eurydice, 2021. Teachers in Europe: Careers, Development and Well-being. Eurydice report. Luxembourg: Publications Office of the European Union

EENEE (2019). Education outcomes enhanced by the use of digital technology. Reimagining the school learning ecology. Luxembourg: Publications Office of the European Union

European Commission (2019). Digital Education at School in Europe. Eurydice Report. Luxembourg: Publications Office of the European Union.

European Commission (2019). 2nd Survey of Schools: ICT in Education. Luxembourg: Publications Office of the European Union

European Commission (2020) Supporting teacher and school leader careers: A Policy Guide. Luxembourg: Publications Office of the European Union

Hodges C., Moore S., Lockee B., Trust T., Bond A. (2020). The difference between emergency remote teaching and online learning. Educase Review.

International Computer and Information Literacy Study (ICILS, 2018), Main findings and implication for education policies in Europe from the 2018 IEA International Computer and Information Literacy Study (ICILS) (europa.eu)

JRC (2017). Digital Education Policies in Europe and Beyond: Key Design Principles for More Effective Policies. Redecker, C., P. Kamyllis, M. Bacigalupo, Y. Punie (ed.), EUR 29000 EN, Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79- 77246-7, doi:10.2760/462941, JRC109311.

JRC (2020). The likely impact of COVID-19 on education: Reflections based on the existing literature and recent international datasets. Luxembourg: Publication of the European Union.

Kormos, Erik M. "The unseen digital divide: Urban, suburban, and rural teacher use and perceptions of web-based classroom technologies." *Computers in the Schools* 35.1 (2018): 19-31.

OECD (2018). Getting ready for the digital world. PISA 2018: Insights and Interpretations. Paris: OECD Publishing.

OECD (2019) TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners, TALIS. available at: <http://doi.org/10.1787/1d0bc92a-en>

OECD Digital Education Outlook 2021: Pushing the Frontiers with Artificial Intelligence, Blockchain and Robots, available at online (oecd-ilibrary.org)

Stelitano, Laura, et al. (2020) "The Digital Divide and COVID-19: Teachers' Perceptions of Inequities in Students' Internet Access and Participation in Remote Learning. Data Note: Insights from the American Educator Panels. Research Report. RR-A134-3." RAND Corporation

ANNEXES

Annex 1: Profile of survey respondents

KEY FINDINGS

- EFEE and ETUCE members responded to the survey
- A good geographical and education sector coverage was achieved

An online survey was undertaken for the joint ETUCE/EFEE project E-speed on the challenges and opportunities for education in the digital era. The survey was filled in by member organisations in the period of November to December 2020, following a common questionnaire format online.

Between November and December 2020, 70 survey responses were received from both ETUCE members education sector trade unions and EFEE members national associations of education sector employers (see Table 1). More ETUCE members filled in the survey compared to the EFEE membership (50 and 20 respectively). However, the percentage response rates are similar from both groups, with approximately 30-40% of their respective members completing the questionnaires for both ETUCE and EFEE. In total, information from 29 countries was received in the survey, showing a good geographical coverage across the membership of both organisations.

From a sectoral perspective, nearly 60% of responding organisations cover all or most education sectors, from early years education, primary education, secondary education, VET and higher education. This represents a good cross section of the education and training landscape. In contrast, the majority of respondents represent more than one sector, while the minority represent one sector. This was mostly the case for 20 trade unions covering the single sector of higher education.

Table A1: Profile of respondents to the survey

	EFEE members	ETUCE members	Both EFEE and ETUCE	
Number of responses	20	50	70	
% of membership	33%	40%	38%	
Number of countries	12	27	29	
Sectors covered	All sectors	1	7	8
	Multiple sectors	13	20	33
	Primary education	0	2	2
	VET sector	2	0	2
	HE sector	2	20	22
	Secondary education	2	0	2

ANNEXES

Annex 2: Case study visit to Denmark

https://www.csee-etuice.org/images/RP_e-Speed_CS_Denmark.pdf

Annex 3: 2nd Case study visit to Bucharest, Romania

https://www.csee-etuice.org/images/RP_e-Speed_CS_Romania.pdf